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CARDIOLOGY FOR THE GENERAL PRACTITIONER

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The extensive subject of cardiology is not amenable to detailed presentation in a short paper. Because of the relatively extensive experimental and clinical activity in this field, a summary of the current state of selected aspects of cardiology might be of interest.

ANTIBIOTICS

The most important single therapeutic development in the field of cardiology has been the advent of antibiotics. These drugs have not only made it possible to convert almost all fatal diseases, such as bacterial endocarditis and endarteritis, to almost nonfatal ones but have played an important role in control of infections in all cardiovascular disease states. Until the introduction of these drugs, the physician was often able to manage satisfactorily the cardiac disturbances, such as congestive failure, only to have the patient die of bronchopneumonia or urinary tract infection. The fear of secondary infection as a threat to life was constantly present, and the more chronic or prolonged the illness and the older or more debilitated the patient, the greater was the chance for infection. Once it developed, the physician was virtually helpless, despite the many therapeutic rituals used. Most physicians well remember the preantibiotic era.

With proper use of antibiotic agents, the physician can control many infections satisfactorily. It is not necessary, or even advisable, however, to administer those of the so-called broad spectrum type to all patients with cardiovascular disease, without regard for the specific problem. The patient should be carefully evaluated first to establish not only a diagnosis but also a "natural history" of the existing disease and determine as precisely as possible what processes are at work and what course might eventuate as a result of certain therapeutic procedures. Certainly, an ambulatory patient with mild, uncomplicated congestive failure does not require antibiotic therapy, whereas in general it should be administered to the patient with severe acute or advanced chronic congestive failure who is expected to remain in failure for several days. Before any medicament is administered, it is advisable to inquire concerning possible drug sensitivity of the patient, since a severe drug reaction may be hazardous in the presence of cardiovascular disease. In the absence of contraindications, one million units of penicillin and 0.5 gm. of dihydrostreptomycin should be administered prophylactically at 12-hour intervals, with constant observation for any unfavorable reactions or development or progression of infections by organisms that are insensitive to these drugs. A cardiac patient with an upper respiratory tract infection, such as the common cold, should surely receive these drugs for prophylactic reasons.

The location and nature of any infection should be determined, every effort being made to isolate the offending organism and to ascertain its drug sensitivity. The proper medicament should be administered by the most expeditious route and in adequate amounts. Some infections, and especially neglected ones, do not always respond dramatically. After several days of trial, therefore, another medicament may have to be substituted or added if the clinical state so dictates and permits. It is imperative that infections be eliminated immediately, since they commonly injure the myocardium and precipitate or aggravate heart failure. The possibility of subacute bacterial endocarditis should be investigated seriously in the patient with a valvular lesion or murmur and an apparent, but unidentifiable, systemic type of infection. An early, accurate diagnosis in bacterial endocarditis is of prime importance, because inadequate antibiotic therapy administered for other purposes may result in drug-resistant organisms, as well as further irreversible valvular and myocardial damage. Once the diagnosis has been established, the appropriate drug should be administered in sufficiently large doses. Therapy should be continued for at least two weeks after clinical cure of the infection, and the patient should be observed frequently over a sufficiently long period to insure complete cure and prevent relapse. Prolonged vigorous therapy, with repeated cultures and determination of drug sensitivity, may be necessary when response to one drug is slow or unfavorable and administration of a different drug is indicated. Furthermore, in vitro sensitivity of an organism to a drug may not necessarily reflect adequately the in vitro sensitivity.

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Rickettsial diseases, which are particularly prone to damage the myocardium seriously, should be recognized early and treated promptly. In fact, early diagnosis and prompt vigorous therapy should be axiomatic for any infection. Prophylaxis should constitute the ultimate aim. Syphilitic disease of the heart and blood vessels is rapidly disappearing with the active control and therapeutic campaign of the United States and state public health services and widespread use of penicillin. When present, such infection should receive prompt penicillin therapy except in the presence of acute cardiac states, such as advanced congestive failure or acute myocardial infarction. When these have subsided, penicillin should be administered in adequate amounts and repeated if dictated by follow-up serologic study. Serious Herxheimer's reactions are rare with penicillin therapy, whereas mild febrile reactions are fairly common.

DIAGNOSIS

Another extremely important development in cardiology, from an over-all point of view, has been the improvement in accuracy of diagnosis. This has been achieved by means of educational programs for the laity as well as improved diagnostic methods, including better interpretation and understanding of electrocardiography, greater and more effective use of roentgenography and use of cardiac catheterization and angiocardiography in complex congenital cardiac defects. Finally, the general practitioner must devote more time to the study of cardiology to improve the accuracy of the diagnosis and therapy, because with aging of the population patients with cardiac disease will be encountered more frequently.

Cardiac catheterization is at this time purely a procedure of important research and special diagnostic value, to be reserved for the limited number of patients with congenital cardiac defects or special problems. This procedure has contributed considerably to knowledge in diagnosis of congenital cardiac defects,[1] including the development of greater confidence in the well-established and conventionally used bedside and other diagnostic procedures. It has verified preexisting concepts in cardiovascular physiology and cardiopulmonary physiology, has revealed some new physiological data, and has stimulated new research and thought. Congenital cardiac defects that require catheterization for diagnostic and therapeutic reasons represent an extremely small percentage of all the cardiac problems, surely less than 0.5%. Although the procedure has helped make cardiac surgery possible for congenital defects, too few patients are amenable to surgical correction to justify application of this procedure in everyday practice by the general practitioner. He should learn to differentiate congenital defects of a surgical nature from those that are not. Because of the expense involved and the need for specially trained technical teams, the occasional patient requiring catheterization and operation should be referred to a specialist for final study. Remember, the primary problems in cardiology are arteriosclerosis and the aging process, hypertension, myocardial infarction, angina pectoris, congestive failure, myocardial degeneration, and cardiac dilatation, none of which requires surgical intervention. Thus, it is the general practitioner's responsibility to become proficient in diagnosis and medical management of these common diseases and to relegate to the specialist the rare and special problems.

CARDIAC SURGERY

Safe performance of an operation on the heart and great vessels[2] of man represents another major achievement in cardiology. This has been made possible by more accurate diagnosis, improved anesthetic facilities, better surgical techniques, but especially, and probably mainly, by the advent of antibiotic therapy. Performance of a major cardiovascular operation in any general hospital by any but a well-trained team is to be vigorously discouraged. There is a pernicious tendency for too many young, inadequately trained surgeons to want to perform cardiac surgery because of the glamour associated with it. For the present, however, one or two highly developed centers in most states would serve adequately and would provide better results than could be obtained by many surgeons performing occasional operations, with limited experience and inadequate facilities. Selection of the surgeon should be made carefully, by investigation of his hospital facilities for anesthesia, recovery, and emergency. Above all, his own mortality rate, rather that the statistics of others from major surgical centers of the world, should serve to determine the operative risk for a given operation. A knowledge of indications and contraindications for cardiac surgery is essential for proper selection of candidates. Existence of a specific lesion alone does not necessarily constitute indication for operation. The patient must be improved by, and not merely survive, the procedure. Good medical therapy should be given an adequate trial before operative intervention is used, unless the disease is unequivocably a surgical one. By all means, make certain that good preoperative and postoperative medical care is available and is instituted.

ANTICOAGULANTS

One of the most important, but little-understood, problems in the field of medicine today is intravascular clotting. Routine use of anticoagulants for coronary occlusion or congestive failure is not recommended by all investigators, nor does it represent the solution to the problem of prevention and management of thromboembolic phenomena.[3] When used, however, it must be used in proper dosage, with proper laboratory control and due consideration for the indications and contraindications. Heparin sodium and bishydroxycoumarin (Dicumarol) are still the drugs of choice if anticoagulants are to be used, even though they fail to solve the problem of thromboembolic phenomena. When cardiac diseases are promptly managed and proper consideration

1. Cournand, A.; Baldwin, J. S., and Himmelstein, A.: Cardiac Catheterization in Congenital Heart Disease: A Clinical and Physiological Study in Infants and Children, London, the Commonwealth Fund, 1949.

2. Blalock, A., and Taussig, H. B.: The Surgical Treatment of Malformations of the Heart in Which There is Pulmonary Stenosis or Pulmonary Atresia, J. A. M. A. **128**: 189 (May 19) 1945. Andrus, E. C.: Selection of Patients with Mitral Stenosis for Surgical Treatment (Valvulotomy), Mod. Concepts Cardiovas. Dis. **20**: 116, 1951. DeBakey, M. E., and Cooley, D. A.: Successful Resection of Aneurysm of Thoracic Aorta and Replacement by Graft, J. A. M. A. **152**: 673 (June 20) 1953.

3. Schnur, S.: Mortality and Other Studies Questioning the Evidence For and Value of Routine Anticoagulant Therapy in Acute Myocardial Infarction, Circulation **7**: 855, 1953. Wright, I. S.; Marple, C. D., and Beck, D. F.: Report of the Committee for the Evaluation of Anticoagulants in the Treatment of Coronary Thrombosis with Myocardial Infarction (A Progress Report on the Statistical Analysis of the First 800 Cases Studied by This Committee), Am. Heart J. **36**: 801, 1948.

is given to prophylaxis, anticoagulants have relatively little to offer. Disregard for all other phases of therapy and reliance on anticoagulants may lead to a sense of false security and serious consequences.

Vectorcardiography and ballistocardiography, unfortunately, have become shrouded in a state of omnipotence and mysticism. From the point of view of everyday practice, they as yet have nothing to offer that is not already available from a careful history; physical examination; and roentgenographic, electrocardiographic, and other routine laboratory studies.[4] These new phases of cardiology are still largely in the experimental stage. Their use for laboratory and clinical research is highly justified and should be encouraged, but the busy general practitioner will only find them confusing. His energies and limited time for study would be more effectively devoted to the already existing, and often inadequately mastered, routine clinical and laboratory procedures. Mastery of electrocardiography, with its well-established and often-tested principles supported by experience would be considerably more profitable in medical practice than inadequate and confusing interest in ballistocardiography and vectorcardiography.

DIETS

Low Fat Diet.—For many years there has been an interest in control of the development of arteriosclerosis. Recently, low fat and cholesterol dieting has been suggested as a prophylactic measure for control of atherosclerosis,[5] but evidence in support of such a regimen has been indirect, inconclusive, and essentially conjectural. For example, the Eskimo obtains 68% of his high daily caloric intake from fat, and yet there is no evidence that he acquires arteriosclerosis or arteriosclerotic diseases more readily than the average American [5b]; in fact the Eskimo has been said to undergo arteriosclerotic change more slowly than a white man in a temperate climate.[5b] His level of serum cholesterol and lipids may even be below normal.[5b] Making prognoses, outlining therapy, and planning diets on the basis of levels of cholesterol, fats, and lipids in the serum, especially without clinical contact with the patient, cannot be justified by existing data. The general practitioner should place the patient on a well-balanced diet, making certain it is not excessive or deficient in any substance known to be important to nutrition. Fats should be restricted in those patients who, for reasons of dyspepsia or obesity, are unable to tolerate such foods. Although a rigid low fat diet appears to produce no serious harm, there is the nuisance associated with its maintenance, and at present the patient with cardiovascular disease seems to fare more satisfactorily on a well-balanced diet unless certain restrictions are specifically required.

Low Salt Diet.—Judicious restriction of sodium in the management of congestive heart failure can be beneficial, but excessive restriction is used too frequently.[6] Rigid sodium-restricted diets should be reserved for the severely ill patient who is known definitely to profit by such a regimen. Patients with mild congestive failure require no restriction; the usual measures for congestive failure, with mere avoidance of excessive salt and salty foods, such as anchovies, bacon, and salted peanuts, are preferable. Prolonged restriction of sodium intake, along with the use of diuretics, can result in hyponatremia, with its accompanying clinical manifestations. Patients on low sodium intake who are receiving diuretics or exchange resins should be observed cautiously for possible development of this syndrome. Furthermore, patients on a low sodium diet do not feel well.

Rice Diet.—The rice diet for persons with hypertension has not proved especially useful in the hands of most physicians because patients have found it too difficult to follow, but it may be tried, especially if the existing hypertension fails to respond to vasodilating drugs. Because doctors and patients are as diet-conscious today as ever, the placebo effects of dieting, as well as its usefulness in weight control and control of associated disease states, must be recognized.

VASODILATORS AND VASOCONSTRICTORS

One of the most important advances in pharmacology and therapy has been development of many drugs, including inhibitors and activators, that influence the sympathetic and parasympathetic nervous systems. Among the ones that demand special consideration in the field of cardiology are those that reduce vascular tone and arterial blood pressure and those that increase vascular tone. All these drugs cannot be discussed in detail, but arterenol (nor-epinephrine), which is produced normally by the adrenal glands, is one of the most useful available today in clinical medicine. Other drugs with essentially similar pharmacological action are also available. Arterenol is extremely useful as a slow (4 to 30 drops per minute) intravenous infusion (in concentrations of 8 to 16 mg. in 1,000 cc. of 5% glucose or normal saline solution or equal parts of each) for raising and maintaining arterial blood pressure, especially when arterial pressure declines in the presence of a simultaneous decrease in venous tone or pressure. Considerable care should be exercised to avoid extravasation into the surrounding tissues, since this usually results in local sloughing, which can be extensive. The rate of the infusion is regulated or titrated by the response in blood pressure. The infusion is used with relatively good success in patients with circulatory collapse associated with coronary occlusion and myocardial infarction. On the other hand, when arterial hypotension is associated with distention of the central veins of the body, such as those of the neck, and venous tone is high, as evidenced by venous hypertension, results obtained with arterenol are disappointing. A vasodilating agent may be more useful, but this has not received adequate investigation to permit its recommendation for general clinical use.

Mephentermine (Wyamine) sulfate or phenylephrine (Neo-Synephrine) hydrochloride has essentially the same role as arterenol in management of hypotension and non-

4. Burch, G. E.: Vectorcardiography, editorial, A. M. A. Arch. Int. Med. **90**: 137 (Aug.) 1952. Starr, I.; Rawson, A. J.; Schroeder, H. A., and Joseph, N. R.: Studies on the Estimation of Cardiac Output in Man, and of Abnormalities in Cardiac Function from the Heart's Recoil and the Blood's Impacts: The Ballistocardiogram, Am. J. Physiol. **127**: 1, 1939.

5. (*a*) Barr, D. P.: George E. Brown Memorial Lecture: Some Chemical Factors in the Pathogenesis of Atherosclerosis, Circulation **8**: 641, 1953. (*b*) Brown, G. M.: Discussion in Macy Conference on Cold Injury, to be published.

6. Burch, G. E.: A Primer of Congestive Heart Failure, American Lecture Series, American Lectures in Internal Medicine, Springfield, Ill., Charles C Thomas, Publisher, 1954.

hemorrhagic circulatory collapse and should be used when the intramuscular route of administration of a vasoconstrictor is necessary. Otherwise, arterenol is preferable. Hypertension remains one of the major diseases of the cardiovascular system. Although no completely satisfactory drug or method for its treatment has evolved, many potent and fairly dependable vasodilators now available permit the physician to approach his patients with considerably greater confidence in his ability to reduce blood pressure than several years ago. Hexamethonium bromide appears to be the best basic drug.[7] Every physician has his individual method of approach in the management of his patients, but he should become thoroughly acquainted with at least one method and use it rather than resort to each new medicament as rapidly as it becomes available.

Pentolinium tartrate [8] is replacing hexamethonium, although hexamethonium is dependable and has been used more extensively. Unfavorable side-reactions from too rapid administration of hexamethonium are frequent but cause relatively few serious sequelae if the dose is increased gingerly and the extent of the patient's sensitivity is slowly determined. Because of considerable individual variations in sensitivity, the initial oral dosage schedule should be 125 mg. every six hours, the amount to be increased by shortening the interval to four hours, if necessary. If the desired results are still not obtained, the amount may be increased further to 250 mg. every six hours, then 250 mg. every four hours, and so on. Thus, the amount of the drug may be increased by increasing the quantity by 125 mg. or by shortening the interval between doses or both. The dose is "titrated" by means of the blood pressure, the dosage being varied at daily intervals unless an emergency necessitates more rapid alteration. In such cases, unfavorable side-reactions are more likely to be encountered, and the patient should, therefore, be kept under constant surveillance. The blood pressure should be recorded with the patient in the supine, sitting, and standing positions. The dose is regulated according to the lowest levels recorded and depends on the position the patient is to assume during the day. A definite reduction in blood pressure with the patient up and about is of benefit, even though the blood pressure rises again when the supine position is assumed.

The blood pressure should not be reduced too rapidly, i. e., no attempt should be made to reduce it to normal levels within the first few weeks. For example, if the blood pressure is 220/130 mm. Hg, efforts should be made to lower the systolic blood pressure to about 170 mm. Hg, the diastolic pressure being essentially disregarded. When this pressure has been maintained for a few weeks at 170 mm. Hg, it may be reduced to 150 mm. Hg or less, depending on the patient's state of health. Hydralazine (Apresoline) hydrochloride or some other supplementary drug may be added to the hexamethonium, but this is usually not necessary until the dose of hexamethonium has reached 500 to 750 mg. Unfortunately, hydralazine is a toxic substance in large doses and is known to have produced serious systemic reactions. Rauwolfia serpentina (Rauwiloid) or its derivatives may prove to be a much better and safer supplement to hexamethonium than the toxic substance hydralazine. It is possible that the purified derivatives such as reserpine (Serpasil) may not be as effective as the crude extract of the root, Rauwolfia serpentina. It is important to remember that this drug is slow-acting and may require three or four weeks to manifest its full effects.

Hexamethonium (Bistrium) bromide can be useful for parenteral administration in hospitalized patients or if a more rapid response is necessary or if the oral route of administration has not produced the desired results. It may be administered intravenously in the following manner: 1 cc. (25 mg.) of the drug is drawn into a tuberculin type syringe. A blood pressure cuff is applied to one arm, and the blood pressure is recorded. Then 0.1 cc. (2.5 mg.) of the drug is administered into a vein of the opposite arm. At least three minutes is allowed for the drug to be circulated around the body to reach the sites of action. The blood pressure is again recorded, and if it has not declined sufficiently, then another 0.1 cc. (2.5 mg.) is administered, and after a lapse of at least another three minutes, the blood pressure is again recorded. This is continued sequentially until the desired reduction in blood pressure is obtained. The patient's general clinical state should be observed carefully during the course of administration. The first injection should not exceed 1 cc. (25 mg.) and may be repeated according to individual needs at four to six hour intervals. The blood pressure should be recorded at frequent intervals after completion of administration of the drug to ascertain the entire pattern of the patient's response. Until this is established, he should not be allowed to sit erect or to stand unless an attendant is present to control any possible syncopal reaction. If the patient shoul feel faint, he should be instructed to lie supine.

Hexamethonium bromide may be administered subcutaneously or intramuscularly in a dosage of 5 mg. every six hours, to be increased by shortening the interval between injections or increasing the dose by units of 5 mg. or by both these means. Usually a dosage of 10 mg. at six-hour intervals is required initially for a satisfactory response. The oral route may be substituted if the patient is discharged from the hospital to his home and parenteral administration cannot be continued there. The most unfavorable reactions include primarily constipation and dryness of the mouth and pharynx. These reactions, as well as blurring of vision, urinary retention, and impotence, may be controlled fairly well with 10 mg. of bethanechol (Urecholine) chloride sublingually every three to six hours or doses of 15 to 45 mg. of neostigmine orally. The syncopal episodes and true syncope should be regarded actually as favorable rather than unfavorable reactions because they indicate overdosage and, more importantly, prove that the drug being used will reduce the patient's blood pressure. Excessive reduction in pressure reflects an excessive dose and does not indicate the drug's uselessness. Unfortunately, the patient tends to acquire tolerance to it, but this can be overcome by supplementing hexamethonium with another drug, increasing the dosage or discontinuing it for a few weeks while an attempt is made to maintain a lowered

7. Freis, E. D.; Finnerty, F. A.; Schnaper, H. W., and Johnson, R. L.: The Treatment of Hypertension with Hexamethonium, Circulation 5: 20, 1952.

8. Freis, E. D.; Partenope, E. A.; Lilienfield, L. S., and Rose, J. C.: A Clinical Appraisal of Pentapyrrolidinium (M & B 2050) in Hypertensive Patients, Circulation 9: 540, 1954.

pressure with other drugs. Furthermore, any unfavorable side-reactions, if noted early, will disappear promptly when the dose of hexamethonium is reduced or the administration is discontinued. When pentolinium tartrate is used, 20 mg. may be administered orally every six to eight hours and increased by 20 mg. every six to eight hours, and the intervals between doses may even be shortened to four hours until the desired effect in blood pressure is obtained. The blood pressure should be watched as closely as described for hexamethonium. As a rule, it is not necessary to exceed a dosage of 100 mg. of pentolinium tartrate every four hours. At the present time, it would be advisable to use this drug in preference to hexamethonium for oral administration, hexamethonium being used only for parenteral administration if the blood pressure must be reduced quickly. More time is necessary for final evaluation of the effects of prolonged administration as well as its advantages and disadvantages.

Finally, it should be remembered that no method is always effective, but reduction of blood pressure and relief of symptoms may be expected in a large percentage of patients. Although reduction of blood pressure is of considerable benefit, patients may continue to decline in health, with ultimate death in the presence of a normal blood pressure. Furthermore, these drugs make sympathectomy unnecessary except possibly in a rare patient with hypertension under special circumstances. Hexamethonium produces a chemical generalized sympathectomy. Since the sympathetic ganglionic blocking agents were introduced, surgical sympathectomy really has little place in the treatment of arterial hypertension. Without any operative risk, these drugs can produce a high incidence of decline in blood pressure and symptomatic relief for the patient. There are many other new drugs that act on the autonomic nervous system. Those that block the parasympathetic system or vagus nerve have little, if any, advantage over atropine, an old drug that is still extremely useful. Furthermore, any inhibitor of the parasympathetic system that supposedly fails to inhibit all portions of this system should be accepted guardedly, for it will most likely not act sufficiently in the desired organ or area. Such drugs apparently do not pharmacologically or therapeutically dissect the parasympathetic nervous system, at least not sufficiently to be clinically effective.

DIURETIC AGENTS

Although new mercurial diuretic substances have been developed no really exciting advances in this group of drugs have been made in recent years. The primary progress has been in more general recognition of their usefulness and alleviation of fear associated with their use. Physicians who integrate their action properly with other therapeutic agents, using them only when necessary and in minimal amounts and duration, will find these drugs useful and relatively innocuous. The mercurial diuretics[9] are the most potent diuretic agents available for management of edema of congestive heart failure and the generalized edematous states in which renal function is altered in the absence of renal insufficiency. They should be used in the smallest amount necessary to provide the desired effects and should never be administered intravenously except for special reasons. Smaller quantities administered frequently produce less pronounced but smoother and more persistent diuresis than larger doses two or three time weekly. For example, it is usually preferable to administer 0.5 to 1 cc. (one-fourth to one-half the usual recommended dose) as a daily dose rather than 2 cc. (a full dose) every other day or so. Massive diuresis over a short period of time or prolonged and excessive diuresis may be fatal. A slightly or moderately edematous living patient is better than a "dry" dead one. Many mercurial diuretic agents are available, and new ones are being developed regularly. It is advisable to learn to use a good one well and change to another only if this is definitely justified. In the presence of disturbances in electrolyte metabolism, the mercurial diuretics may fail to produce diuresis. When no response is obtained, therefore, the electrolyte levels in the serum should be investigated and any disturbances in chloride and sodium, or other electrolytes, and pH should be corrected. Once a correction is effected, the diuretic agent will initiate a response if the cause for failure was electrolyte imbalance. These problems have been discussed in greater detail elsewhere.[6]

Carbonic anhydrase inhibitors, such as Diamox (acetozoleamide), may have limited value as diuretics in the treatment of edematous states. When the usual procedures, including the mercurial diuretic agents, fail, the carbonic anhydrase inhibitors will probably serve little use. One should not resort to them at the expense of other procedures until more conclusive data and indications have been obtained from clinical trials and experience. These agents act whenever carbonic anhydrase is found, which is throughout the body. They will undoubtedly teach us a great deal about fluid and electrolyte exchange across membranes, as evidenced already by the limited experiences of dramatic favorable responses in acute glaucoma.

PERIPHERAL VASCULAR DISEASE

Unfortunately, interest in the heart, especially as a result of the glamour associated with cardiac surgery, has deflected attention from the peripheral blood vessels. Disease of the blood vessels, including arteriosclerosis, remains a major problem. As the mean age of the population increases, arteriosclerosis will become an even greater problem, and recognition of its development and its many manifestations of disturbances in tissue function, including cardiac, cerebral, and peripheral vascular, will gain importance. Only simple clinical procedures are necessary to make a diagnosis of disease of the peripheral blood vessels in the majority of patients. Careful and proper examination of the patient can be performed very accurately and adequately by inspection, palpation, simple functional testing, use of the sphygmomanometer, and careful taking of history. The greater the physician's knowledge of the circulation, the less complex apparatus he requires for study of the patient. A cursory clinical study can result in significant errors.

All patients, and especially those suspected of having peripheral vascular disease, should be carefully and meticulously interrogated during the history taking. Evi-

9. Ray, C. T., and Burch, G. E.: The Mercurial Diuretics, Ann. J. M. Sc. 217: 96, 1949.

dences of pain, intermittent claudication in all muscle groups supplied by the vessels under consideration, variations in dermal color and temperature with the part above, below, and at heart level, sensitivity to cold, ulcerations, scars, rate of healing of lesions, rate and character of growth of the nails and hair, texture of the skin, rate and amount of sweating, and trauma to the part are among the many factors to be discussed with the patient. The psychiatric state of the patient should always be evaluated, especially for anxiety and tension states. Smoking and drinking habits, use of drugs, occupation, and exposure to heavy metals and toxic substances should be investigated. Habits of work and rest are also important. The patient should be examined under proper conditions. He should rest supine on a rigid examining table for at least one hour before the examination is conducted. No part of his body should be exposed to a source of heat, draft, or cold, for this will produce unequal circulatory states and affect cutaneous temperature and color. All parts of the body should be equally covered, for if one part is covered and another uncovered, they may appear quite different on comparison. The peripheral circulation should be examined by comparing the same parts and areas on both sides. For example, the feet should be compared with each other as to color, size, lesions, visible pulsations, visible vessels, nail growth, and the like. Thermal differences of less than one degree can be detected by palpation. The main arteries should be palpated not only for pulsations but also for texture of the walls and tortuosity, including the dorsalis pedis, posterior tibial, popliteal, femoral, iliac arteries, and abdominal aorta, as the examination progresses from the feet to the abdomen. The same approach should be used for the upper extremities, head, and neck. For example, it is extremely unlikely for one to have coarctation of the aorta, especially of a degree requiring operation, if the arteries of the lower extremities pulsate well. Furthermore, if there is unilateral, bilateral, or aortic obstruction, adequate palpation of the arteries will localize the obstruction accurately, which is so important in management.

The extremities should be examined with the part passively elevated, one side being raised first for 5 to 10 minutes and then the other, one part always maintained at heart level for comparison. The part should then be placed below the level of the heart for 5, 10, or more minutes. These influences of gravity produce a simple and fairly standard stress on the blood vessels and circulation and serve as a simple functional test that requires no elaborate or nonstandard gadgets or procedures.[10] Palpation is clinically superior to thermocouples used in the open ward for the study of the adequacy of the peripheral circulation. Furthermore, oscillometric, plethysmographic, and isotope clearance curves are of little practical value and totally unnecessary for the usual peripheral vascular disease states. When the complexity of the problem warrants such special examinations, the patient should be referred to special centers. Seldom is this necessary, however, when the ordinary clinical evaluation is satisfactorily conducted.

Examination of the veins, an extremely important, usually neglected, and little-known portion of the circulation, is extremely important. Venous pressure should be measured[11] not only in the median basilic vein at the antecubital space but also in any vein on the surface of the body that needs study. It appears that methods for measuring venous pressure that practically limit their application to the median basilic vein have been partially responsible for retardation of the study and knowledge of veins. Furthermore, in most instances mere inspection of the neck veins (Lewis test) or observation of the level at which the veins on the dorsum of the hand collapse during passive elevation of the hand (Gaertner test) is equally informative and much simpler a procedure for routine use in all patients than the method commonly used by physicians today.[11] The physician should inspect, palpate, and measure, when necessary, the pressure within and compare the veins about the body. The direction of blood flow and function of valves should be observed carefully. Sharp localization of the point of venous obstruction is of extreme importance in diagnosis and therapy and can be accomplished in the physician's office, without any complex apparatus. The various vascular diseases and their manifestations must be known in order to ascertain the correct diagnosis and treatment. Recent advances in aortic and arterial surgery with the autogenous, homologous, heterologous, plastic or substitutional grafts, such as aneurysmectomy, excision of the segment of coarctation, short circuiting around diseased vascular segments, and thrombectomy and embolectomy, have made possible alleviation of obstruction to large vessels. The general physician must, therefore, be able to make correct diagnoses if the patient is to receive proper therapy. Furthermore, he must know the type of surgical treatment available, when it is indicated, and what results may be expected.

Use of vasodilating drugs, reduction diet, rest, limitation of exertion within maximal circulatory reserve or capacity, prohibited use of tobacco by all patients, and local care of the part are among the general therapeutic measures available. Medical management is sufficient in most patients and can be rewarding if used meticulously and followed religiously by the patient. Even in patients who require surgical intervention, preoperative and postoperative care can best be rendered by the family doctor. No specific drug has yet been found that will cure any peripheral vascular disease or will dilate all and only vessels in the diseased part. All vasodilators produce generalized vasodilatation, but when these are used in conjunction with other good medical measures, satisfactory results are often obtained. According to the principle of hemometakinesia,[12] local vasodilatation produced by sympathetic nerve blocking with procaine or by sympathectomy should produce the best results, but, unfortunately, effects are usually of short duration. Local intra-arterial injections of vasodilators are painful and annoying to the patient and the doctor and yield disappointing results. Judicious use of generalized medical measures, vasodilators, and surgical correction, properly

10. Lewis, Sir T.: Vascular Disorders of the Limbs: Described for Practitioners and Students, Toronto, MacMillan Co. of Canada, Ltd., 1946.
11. Burch, G. E.: A Primer of Venous Pressure, Philadelphia, Lea & Febiger, 1950.
12. DeBakey, M. E.; Burch, G. E., and Ray, C. T.: Hemometakinesia: Therapeutic Application to Peripheral Vascular Disease, J. Michigan M. Soc. 47: 636, 1948.

integrated to meet the needs of the individual patient, will remain most effective until further advances are made in prevention and treatment.

USE OF ISOTOPES

From the point of view of the general practitioner, isotopes have little clinical application in cardiovascular diseases. Whereas they have contributed considerably to knowledge in medicine and in fundamental aspects of normal and abnormal cardiovascular disease states, these elements are of little use in diagnosis and treatment. Blumgart and associates introduced the use of radioactive iodine (I^{131}) to produce hypothyroidism, the degree being controlled with thyroid extract, if necessary, in management of advanced cardiac diseases, including angina pectoris. Their reports, as well as those of others, seem favorable. Before attempting this, however, the physician should place the patient on a good medical regimen, allowing sufficient time for a response and remission of the disease. Angina pectoris is fairly variable in severity, and I^{131} may not be required. Furthermore, a trial of propylthiouracil is advisable first, in doses greater than 100 mg. three times a day. If the response is not satisfactory, the propylthiouracil may simply be discontinued and the thyroid state allowed to return to normal. On the other hand, once the cells of the thyroid have been destroyed with I^{131}, thyroid extract must be administered for the remainder of the patient's life. Moreover, propylthiouracil has not been shown to be carcinogenic, whereas radioactive substances have. This danger with I^{131} therapy has not been statistically evaluated. The papers of Blumgart should be consulted for detailed information concerning the use of this element.

I^{131} is also used in the management of hyperthyroidism, which may produce heart disease. Use of antithyroid drugs like propylthiouracil has proved to be another important advance in management of thyrotoxic heart disease. Patients who have advanced cardiac disease or constitute poor operative risks can now be managed well with this drug. The physician who does not have access to I^{131} may use propylthiouracil in a large number of his patients and often obtain a permanent response after several months of continuous treatment. When hyperthyroidism is present, the physician must decide whether the patient also has heart disease and whether it is entirely or partially the result of thyrotoxicosis. If the cardiac disease is entirely thyroid in origin and if it is treated early and properly, it will be reversible. The use of propylthiouracil or I^{131} does not involve the danger of operative risk. Obviously, the usual procedures should be used, including rest, sedation, and high-caloric and well-balanced diet, as well as measures directed at the heart, such as digitalization for congestive failure. The patient should be given 200 mg. of propylthiouracil with 10 drops of strong iodine (Lugol's solution) three times daily. Lugol's solution will depress the hyperthyroidism within 7 to 14 days and will maintain that state until the propylthiouracil has had an opportunity to establish its action, which requires from three to eight weeks. When this occurs, use of Lugol's solution may be stopped, and the dose of propylthiouracil may be reduced to about 100 mg. or less three times daily as a maintenance dose to establish a euthyroid state. Variations in dosage and other therapeutic measures are governed by careful clinical study, including observations for leukopenia and thrombocytopenia. Administration of the drug may be discontinued after a year or more, careful observation of the patient being maintained, with reinstitution of therapy if there is recurrence of hyperthyroidism.

If an antithyroid drug cannot be used, then I^{131} should be administered, especially if the patient is old and not likely to live long enough to encounter the danger of malignant involvement, should this agent be carcinogenic. If operation is indicated, it should be performed only after a euthyroid state has been present for three or more months and the patient's state of health is normal. Lugol's solution should again be administered for two or three weeks preoperatively. Surgical intervention however, is less important in the management of the hyperthyroid patient today. It appears that the relative merits of I^{131}, antithyroid agents, and operation have yet to be fully established, but the operative risk for the particular circumstances under which the patient will be operated must be weighed, and not those existing in some large center. The reliability of radioactive elements and Geiger-Müller and scintillation counters in evaluation of the state of the circulation has yet to be fully established and should be relegated entirely to the category of research. Simpler, more practical, and better methods are available as indicated earlier in this paper.

SUMMARY AND CONCLUSIONS

From everyday practice, the major problems of the cardiovascular system that confront the physician are arteriosclerosis, as well as Raynaud's disease, thromboangiitis obliterans (Buerger's disease), collagen disease, myocarditis and myocardial degeneration, cardiac dilatation, angina pectoris, coronary thrombosis, intravascular clotting in general, congestive heart failure, shock, and the cardiac neuroses. It is evident that all the major problems still remain unsolved, although some advances have been made. The tendency to use new, unproved gadgets and drugs must be considered objectively and in light of the best interest of the patient. The physician must not neglect or withhold some of the old, established procedures to introduce new, unproved, and even injurious ones. The investigator has an extremely important responsibility, often ignored or unrecognized, to the general practitioner. His enthusiasm for his own investigations must never permit him to fail to delineate clearly the purely investigative from the practical aspects. The general practitioner may have to provide the proving grounds for massive testing but should not be misled into accepting anything as established for routine clinical use when it is not. This is particularly important when the measure involves expense to him and the patient and when no definite service and possible harm may be rendered. Failure to maintain a clear perspective is failure to discharge one's responsibilities in research and, therefore, failure to perform a thoroughly good job.

The general practitioner is in need of exercising a more critical and responsible attitude. To achieve this, adequate study, perusal of the current literature from many sources, meditation, and reflection are necessary. The deliberate approach to a clinical problem requires time for thought and deliberation and cannot be replaced by

a routine designed to serve large numbers of patients rapidly and, too often unsatisfactorily. It is difficult to justify the use of new and expensive diagnostic and therapeutic procedures and agents, unless definitely superior, before the commonly accepted and proved ones have been applied or the data and records for newly developed diagnostic apparatus have been evaluated. The satisfactory and accepted old method should be learned first and then, with adequate awareness of the circumstances, the new ones may be used gingerly, with the necessary caution for clinical trials. They should be accepted and discarded as objectively as they have been investigated. There is too much gadgeteering in new procedures and too little application of the established fundamental ones in general clinical medicine. The present era seems to be one of applying something "new" first and evaluating it later. This is true for the cardiovascular field, with too infrequent admission of error by the advocators when failures result and hasty recommendations prove erroneous. These comments must not be construed as suggesting that medical science remain static but rather that more care be exercised when new and unproved methods are introduced into the practice of medicine.

Finally, an important need in the field of cardiovascular disease is better and more hospital facilities for prolonged care of patients with chronic cardiac disease. Separate institutions, wards, portions of hospitals, or additional beds, with adequate ancillary services to permit much longer periods of bed rest, especially for patients with myocarditis, myocardial degeneration, cardiac dilatation, chronic ulcers of the leg and foot, and slowly reversible cardiac and peripheral vascular disease states, are needed. The cardiac patient should have greater access to air-conditioned wards, rooms, hospitals, bedrooms, and homes for optimal improvement in the hot and humid periods of the year. This has been discussed briefly elsewhere.[13] The hospitalization facilities for the patient with cardiovascular disease are at the same stage as were those for tuberculosis at the turn of the century. These and many other complex and extensive phases of cardiology for the general practitioner have only been discussed briefly; greater details and extension must be left to the physician's imagination, reading, and study. Time, especially for meditation and reflection, is the greatest shortage in medicine today. More must be devoted to the patient with cardiovascular disease.

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COMPARATIVE FATALITY OF POLIOMYELITIS IN FAMILIES WITH SINGLE AND MULTIPLE CASES

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In recent years there has been a reduction in the case fatality of poliomyelitis. In some degree this reduction may be related to better reporting of nonparalytic cases. Improved methods of treatment, particularly artificial respiration and more highly organized medical care, may also have contributed to the decline.[1] Nevertheless, the disease is still a cause of many deaths.[2] Epidemiological investigation of some of the specific factors that influence fatality reveals an association with clinical type and age.[3] Clinical infection is most lethal among those patients with bulbar paralysis, particularly patients over 14 years of age, and the disease is least fatal in those patients under 5 years who do not have bulbar symptoms. The bulbar form of poliomyelitis includes involvement of cranial nerves as well as of medullary centers.[4] It is the latter group that is responsible for most deaths.[5] Apparently, involvement of vital medullary centers is relatively more common in adults than in children with bulbar poliomyelitis.[3c]

The conditions predisposing to bulbar paralysis and to the high fatality rate in persons over 14 years of age are unknown. Aside from tonsillectomy, no other factor has been directly implicated in the bulbar localization of paralysis.[6] Obviously, more basic investigation and epidemiological data are needed for a clearer understanding of the factors implicated in the outcome of this infection. Epidemiological studies have demonstrated important differences between afflicted families and the general population, and these may have some bearing on the problem. It has been shown that the virus is heavily seeded in families in which there are cases of poliomyelitis.[7] Consistent with this finding is the observation that the attack rate among familial contacts may be 40 times greater than in the general population.[8] This difference is most marked among familial contacts over 14 years, and it seems to vary with the clinical type of infection that first appears in the household.[9]

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The factors influencing the occurrence of multiple clinical infections among familial contacts might also be associated with differences in case fatality. Consequently, a comparative study was made of the case fatality in families with only one case of poliomyelitis and those with more than one case. The data to be presented were collected in New York City from 1949 to 1953, inclusive, under conditions previously described.[8] During this

TABLE 1.—*Annual Number of Cases and Deaths*

	Cases		Deaths	
Year	No.	Rate per 100,000	No.	Case Fatality, %
1949	2,446	31.0	179	7.3
1950	1,064	13.1	64	6.0
1951	555	6.8	20	3.6
1952	821	10.2	28	3.3
1953	677	8.5	30	4.4

five year period, a total of 5,563 cases and 321 deaths were reported, a crude over-all fatality of 5.8%. The annual number of cases and deaths fluctuated each year, as shown in table 1. Most of the deaths occurred in 1949, when the disease reached epidemic proportions. In the other years, which were considered as nonepidemic, the number of deaths ranged from 20 to 64 annually for a total of 142.

The case fatality by age group during the five year period of observation is summarized in table 2 for all clinical types of cases, including the paralytic and non-

TABLE 2.—*Fatality, by Age Group*

	All Clinical Types			Paralytic Types		
		Deaths			Deaths	
Age, Yr.	Cases	No.	%	Cases	No.	%
0-4	1,508	41	2.7	1,102	41	3.7
5-9	1,789	72	4.0	1,007	72	7.1
10-14	949	48	5.1	519	48	9.3
15-19	496	54	10.9	312	54	17.3
20 and over	821	106	12.9	558	106	19.0
Total	5,563	321	5.8	3,498	321	9.2

paralytic combined, and the paralytic alone. The case fatality increased with age. Thus, there was about a two-fold difference between ages 0-4 and 5-14, and a two-fold difference between ages 5-14 and 15 and over. The combined case fatality under 15 years of age was about a third as great as that for older patients.

The age-specific differences were considered in a comparative study. The number of cases observed in families with one case of poliomyelitis and those with more than

TABLE 3.—*Number of Cases Observed per Family*

		Paralytic		Nonparalytic	
Cases per Family	Total	No.	%	No.	%
Single	5,181	3,253	62.8	1,928	37.2
Multiple	382	245	64.1	137	35.9
Total	5,563	3,498	62.9	2,065	37.1

one case are given in table 3. The frequency of paralytic poliomyelitis was comparable in both groups. It was observed in 62.8% of the single cases and in 64.1% of the multiple cases or in almost two-thirds of the cases investigated in each group. The percentage age distribution of single and multiple cases considered in the study are given in table 4. There appeared to be relatively more patients 15 years and over among the single cases than the multiple. These differences would tend to increase the crude case fatality of single cases and should be considered in the evaluation of the results.

The over-all case fatality of single and multiple cases is given in table 5. The fatality of multiple cases was 8.1 as against 5.6% for single cases, a relative difference of 45%. When based on paralytic cases only, the case fatality was 12.7 and 8.9% respectively. The expected case fatality among multiple cases adjusted for age was 5.0 based on all cases and 8.4% based on paralytic cases only. The difference in fatality of single and multiple cases was considered statistically significant. (Values of p less than 0.05 were considered significant.)

TABLE 4.—*Percentage of Age Distribution of Cases per Family*

	All Clinical Types		Paralytic Types	
Age, Yr.	Single Cases	Multiple Cases	Single Cases	Multiple Cases
0-4	26.9	30.1	31.5	31.8
5-9	31.7	39.0	28.3	35.9
10-14	17.1	16.8	14.9	13.9
15-19	9.2	5.0	9.1	5.7
20 and over	15.1	9.1	16.2	12.7
Total	100.0%	100.0%	100.0%	100.0%

The relation of the age of the host to the increased fatality of multiple cases was studied by comparing observed and expected number of deaths in various age groups. By applying the age-specific case fatalities for the city as a whole to the multiple number of cases per household, the expected number of deaths in each age group was calculated and compared with the observed number. The number of deaths observed in each age group and the number of expected based on all reported cases and on paralytic cases only are given in table 6. For all ages combined, there was about a 50% increase in deaths over

TABLE 5.—*Over-All Case Fatality per Family*

	All Clinical Types			Paralytic Types		
		Deaths			Deaths	
Cases per Family	Cases	No.	%	Cases	No.	%
Single	5,181	290	5.6	3,253	290	8.9
Multiple	382	31	8.1	245	31	12.7
Total	5,563	321	5.8	3,498	321	9.2

the number expected. The increase appeared to be most marked in patients 15 years of age and over and was considered statistically significant in these patients. In younger patients, the increase was less marked, not consistent, and attributable to sampling variation. As shown in the figure, the deaths expected under 15 years of age were 12.3 and the number observed 15. In older patients, the number expected was 6.6 when based on all cases and

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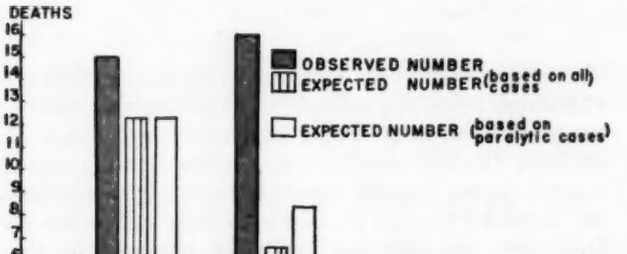
8.3 when based on paralytic cases only. The observed number was 16, which represented an increase of about 100% over expectancy.

In terms of case fatality, the observed and expected deaths per 100 multiple cases under 15 years of age and 15 years and over are given in table 7. Thus for those

TABLE 6.—*Number of Deaths*

Age, Yr.	Observed No.	Expected No. Based on All Cases	Expected No. Based on Paralytic Cases
0-4	5	3.11	2.90
5-9	9	5.99	6.29
10-14	1	3.24	3.15
15-19	5	2.07	2.42
20 and over	11	4.51	5.90
Total	31	18.92	20.66

persons under 15 years of age the differences between observed and expected values were small and not statistically significant, while for those 15 years and over there were significant differences between observed and ex-



Fatality in multiple cases of poliomyelitis per family, by age group in New York City, 1949-1953.

pected case fatalities. In the latter group of multiple cases about one out of every three patients died. In seeking an explanation for the high case fatality of multiple cases over 14 years of age, the frequency of bulbar cases and their case fatality were investigated. The data on the frequency of bulbar poliomyelitis by broad age groups are summarized in table 8 for multiple and single cases per family. Under 15 years of age, about 16% of single and multiple cases had bulbar symptoms. In patients over 15 years of age, the frequency of bulbar poliomyelitis was increased somewhat for single cases and more than

TABLE 7.—*Case Fatality per 100 Cases*

Age, Yr.	All Cases Observed	All Cases Expected	Paralytic Cases Observed	Paralytic Cases Expected
Under 15	4.6	3.8	7.5	6.2
15 and over	29.6	12.2	35.6	18.5

doubled for multiple cases. In these older patients, the percentage with bulbar paralysis was significantly greater in families with multiple cases than with single cases.

The case fatality of the bulbar cases in both groups of families by age of the patient is given in table 9. As expected, the case fatality increased with age in both groups of households; however, the increase with age was proportionally greater in families with multiple cases than in those with single cases. In the former group, the case fatality was 50% greater than in the latter among patients 15 years of age and over. The difference was considered statistically significant. In younger patients there was no significant difference in the fatality of bulbar cases occurring in families with one or more than one case. Thus, there appeared to be two factors operating to increase the number of deaths observed in multiple

TABLE 8.—*Frequency of Bulbar Poliomyelitis*

Cases per Family	Under 15 Years of Age: All Cases	Under 15 Years of Age: Bulbar Cases No.	Under 15 Years of Age: Bulbar Cases %	15 Years of Age and Over: All Cases	15 Years of Age and Over: Bulbar Cases No.	15 Years of Age and Over: Bulbar Cases %
Single	3,918	637	16.3	1,263	249	19.7
Multiple	328	54	16.5	54	19	35.2
Total	4,246	691	16.3	1,317	268	20.3

cases over 14 years of age—the frequency of bulbar paralysis and the fatality of bulbar cases. Both seemed to be increased more than one would expect by chance alone in patients 15 years and older. In younger patients, however, there was no evidence of a change in either the frequency of bulbar paralysis or in its case fatality in families with multiple cases.

Further probing of the available information on multiple cases revealed that the increased fatality of bulbar poliomyelitis in patients over 14 years of age seemed to

TABLE 9.—*Fatality from Bulbar Poliomyelitis*

Cases per Family	Under 15 Years of Age: Bulbar Cases	Under 15 Years of Age: Deaths No.	Under 15 Years of Age: Deaths %	15 Years of Age and Over: Bulbar Cases	15 Years of Age and Over: Deaths No.	15 Years of Age and Over: Deaths %
Single	637	134	21.0	249	121	48.6
Multiple	54	10	18.5	19	14	73.7
Total	691	144	20.8	268	135	50.4

be related to differences in the outcome of the first case to occur in the family and of those that developed subsequently. A summary of the fatality of bulbar poliomyelitis in initial and subsequent cases by age group is given in table 10. The case fatality was increased only among subsequent cases 15 years of age and over, in which all of the 11 patients with bulbar poliomyelitis died. Of these, four were 15 to 19 years old, three were 20 to 29 years, and four were 30 to 39 years of age.

TABLE 10.—*Fatality from Bulbar Poliomyelitis in Initial and Subsequent Cases*

Time of Occurrence in Family	Under 15 Years of Age: Bulbar Cases	Under 15 Years of Age: Deaths No.	Under 15 Years of Age: Deaths %	15 Years of Age and Over: Bulbar Cases	15 Years of Age and Over: Deaths No.	15 Years of Age and Over: Deaths %
Initial	30	6	20.0	8	3	37.5
Subsequent	24	4	16.7	11	11	100.0
Total	54	10	18.5	19	14	73.7

Three of the 11 patients with bulbar poliomyelitis developed symptoms of poliomyelitis less than three days after the onset of the first case that had occurred in the afflicted household and were presumably infected from the same source as the initial case. The remaining eight cases occurred from 4 to 31 days after the onset of the first case or within the incubation period of the disease for sec-

ondary cases. Three cases occurred from 4 to 6 days after the first case and five from 7 to 31 days. In these eight cases, the possibility of secondary infection from the initial case could not be excluded.

COMMENT

The foregoing data on case fatality revealed differences between single and multiple cases of poliomyelitis in one household that seemed to be of prognostic and epidemiological significance. Multiple household cases in which the patients were 15 years and over had an inordinately high mortality, while younger patients in the same household did not show a significant increase in case fatality. The results observed were related to an increase in the frequency of bulbar poliomyelitis and in its case fatality. None of these changes was observed in younger patients. The data, therefore, pointed to some host or environmental factor associated with age as responsible for the results observed. If the agent alone were implicated, one would expect the results to be comparable at all age levels and possibly more pronounced in the younger groups.

The explanation of these results is not clear. They are associated, in part, with the order in which the multiple cases occurred in the household. Thus, the observed increase in the fatality of bulbar cases was limited to persons over 14 years of age in whom the disease developed after the onset of the initial case in the family. In most of these instances, the time interval between the onset of cases in the same family was four or more days, or within the incubation period of the disease. In these patients, therefore, secondary infection from a primary case in the household cannot be excluded. The results do not seem to be attributable to bias in reporting or in medical care. With respect to reporting, the case fatality was based on paralytic cases as well as on all cases. Since paralytic cases are fairly completely reported and the diagnosis reasonably accurate, there is no reason to implicate bias in reporting.

With respect to differences in medical care, there was no evidence of such bias. In New York City, over 90% of all patients in reported cases were hospitalized, particularly paralytic ones. This was true of single and multiple cases. Furthermore, most of the patients were treated in three public hospitals for communicable diseases. The proportion hospitalized in voluntary institutions was comparable in the two groups. The question of sample size is of considerable importance. Although there were 382 cases of poliomyelitis in the group with multiple cases, of which 245 were paralytic, the over-all case fatality was low and the number of deaths was consequently small; however, the results were consistent in the epidemic year of 1949 and in the following four endemic years.

SUMMARY

The case fatality of poliomyelitis in families with single and multiple clinical infections, compared over a five year period from 1949 to 1953 under conditions prevailing in New York City, the case fatality was greater in families with multiple cases than in those with single cases. The increase in deaths among multiple cases appeared to be limited to patients 15 years of age and over and was attributable to the high frequency of bulbar poliomyelitis and its associated higher case fatality. Differences in the vulnerability of the host were discernible among multiple cases that were related to both age and the sequence of occurrence of the disease in the household.

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PHARYNGOCONJUNCTIVAL FEVER

EPIDEMIOLOGICAL STUDIES OF A RECENTLY RECOGNIZED DISEASE ENTITY

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Through the interest and cooperation of private practicing physicians and health officers in the various communities of metropolitan Washington, D. C., and Leesburg, Va., we observed over 300 cases of an acute respiratory illness that appears to represent a newly recognized communicable disease entity. In brief, the clinical disease was characterized by fever, pharyngitis, and conjunctivitis, occurring either singly or in combination. A newly discovered virus, adenoidal-pharyngeal-conjunctival (APC) type 3, was recovered from 80 of the patients, and a specific serologic antibody response was found in practically every patient tested. Epidemiologically, cases occurred in all age groups but predominantly in children. The disease occurred in epidemic form in a summer day camp and in two residential neighborhood outbreaks, and it has occurred sporadically throughout the area. The disease was apparently infectious and spread from person to person, with an incubation period of five to nine days.

The adenoidal-pharyngeal-conjunctival viruses are viruses of the respiratory tract.[1] They produce unique cytopathic changes in tissue culture of epithelial cells. They are nonpathogenic for laboratory animals, ether

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The authors appreciate the tolerance and assistance of the many physicians and persons whose cooperation made this study possible. Aside from those heretofore mentioned, Drs. A. Cockburn, M. Schaeffer, and F. S. Cheever, who furnished the specimens from Greeley, Colo.; the health officers of Fairfax County and Alexandria, Va., Drs. Harold Kennedy and Thomas F. McGough; and the staff of the Burgundy Camp, under the direction of Dr. Robert Burnham and Miss Constance Bell, deserve special mention.

resistant, heat labile, filtrable, and resistant to antibiotics. The group is characterized by a soluble, non-type-specific antigen that gives a group reaction in the complement fixation test. However, the neutralization test is type specific, and, to date, six immunologically distinct types have been identified. Types 1, 2, 4, 5, and 6 have been found in tonsil and adenoid tissues by a new virus isolation technique. Type 4 has been associated with acute febrile respiratory disease in military recruits,[2] and type 3 (APC-3) has been found the causative agent of the disease here reported.

In 1943, Derrick [3] described three cases of conjunctivitis associated with fever that he thought were probable cases of inclusion conjunctivitis (swimming-bath conjunctivitis). From his clinical description, the three cases were similar to many observed in this study. In 1953, Cockburn [4] described an epidemic in Greeley, Colo., of a febrile illness commonly associated with conjunctivitis and sore throat, which he called "Greeley disease." From the clinical description, some of the Greeley cases appear similar and some quite different from those observed here. Eight paired serum specimens from Greeley patients with disease in the acute and convalescent stages were sent to our laboratory for test. These eight specimens showed a specific neutralizing antibody response to APC-3 virus. In February, 1954, Parrott and coworkers [5] observed the occurrence of eight cases of nasopharyngitis, six with fever and four with conjunctival injection (two definite conjunctivitis) at the Clinical Center of the National Institutes of Health. APC-3 virus was isolated from six of these patients, and seven had a neutralizing antibody response to APC-3 virus antigen. Within a few months, on July 23, Dr. Frederick G. Burke of Georgetown University School of Medicine advised that he was seeing a number of such cases in Alexandria, Va. These cases led us to the Burgundy Farm Summer Day Camp, where Dr. Thistle McKee, the consulting pediatrician advised that many children were absent with a febrile illness often associated with conjunctivitis. The Fairfax County health department and camp authorities welcomed our proposal for investigation.

After visiting a number of patients from whom APC-3 virus was recovered from eye swabs and throat swabs, it was obvious that an opportunity existed to collect epidemiological observations concerning whether this virus was the cause of human disease. This was the chief objective of the study. It was recognized, however, that, if the virus were eventually found to be the cause of disease, it would be necessary to define the clinical symptoms and signs that enable its identification, to know its manner of occurrence, the chief source of infection, the mode of spread, incubation period, and period of communicability —all essential to devising methods for treatment and control. Thus, the study was designed to collect epidemiological observations that would shed light on these important questions.

DESCRIPTION OF STUDY

This report covers a study of an extensive outbreak of illness at the children's summer day camp and includes a study of all camp staff and children and their household associates. It also covers a study of cases occurring in two residential neighborhood outbreaks in the Hollin Hall and Broyhill areas. In addition, it includes a study of sporadic cases. The study was limited to the metropolitan area of Washington, D. C., and vicinity during the summer of 1954. Table 1 and figure 1 shows the groups studied and the time occurrence of cases. The cases here reported constitute all cases of conjunctivitis and all illnesses with fever or sore throat (excluding illnesses of obvious origin, e. g., measles, herpangina, and roseola) that were found in association with the epidemic outbreaks or were found in persons in household association with persons with possible clinical cases. They are grouped epidemiologically, groups 1 and 2 relating to the camp outbreak, groups 3 and 4 relating to the two neighborhood outbreaks, and group 5, the sporadic cases.

The Burgundy summer day camp, group 1, is located in Fairfax County, Virginia, three miles southwest of Alexandria. The camp represents a six-week summer enterprise of the Burgundy Farm Country Day School. This is a parent-built, parent-owned school, with no race or creed restrictions. The camp had six-hour sessions, five days a week, for the six-week period June 28-Aug. 6. Both the camp families and school families frequently used the grounds and swimming and wading facilities at times other than camp hours. The campers were nearly all white children, 4 to 12 years of age, who lived at their

TABLE 1.—*Study Experience, June 26 to Oct. 10, 1954*

Epidemiological Group	Persons Observed	Specimens		Persons Ill			Persons Not Ill		
		Tested	APC-3 Positive	Persons	Tested	APC-3 Positive	Persons	Tested	APC-3 Positive
1. Burgundy Camp	203	343	69	147	105	35	56	34	..
2. Burgundy Camp households	435	113	19	81	28	13	354	18	..
3. Broyhill area	43	19	4	25	8	3	18	2	..
4. Hollin Hill area	214	68	28	104	29	20	110	8	..
5. Sporadic cases	75	80	19	25	16	9	50	22	..
Total	970	623	139	382	186	80	588	84	..

1. (*a*) Rowe, W. P., and others: Isolation of a Cytopathogenic Agent from Human Adenoids Undergoing Spontaneous Degeneration in Tissue Culture, Proc. Soc. Exper. Biol. & Med. **84**: 570-573 (Dec.) 1953. (*b*) Huebner, R. J., and others: The Adenoidal-Pharyngeal-Conjunctival Agents: A Newly Recognized Group of Common Viruses of the Respiratory System, New England J. Med. **251**: 1077-1086 (Dec. 30) 1954. (*c*) Rowe, W. P., and others: Studies of the Adenoidal-Pharyngeal-Conjunctival (APC) Group of Viruses, Am. J. Hyg., to be published.

2. Hilleman, M. R., and Werner, J. H.: Recovery of New Agent from Patients with Acute Respiratory Illness, Proc. Soc. Exper. Biol. & Med. **85**: 183-188 (Jan.) 1954. Footnote 1*b* and *c*.

3. Derrick, E. H.: Swimming Bath Conjunctivitis, with a Report of 3 Probable Cases and a Note on Its Epidemiology, M. J. Australia **2**: 334-336 (Oct. 23) 1943.

4. Cockburn, T. A.: An Epidemic of Conjunctivitis in Colorado Associated with Pharyngitis, Muscle Pain, and Pyrexia, Am. J. Ophth. **36**: 1534-1539 (Nov.) 1953.

5. Parrott, A. H., and others: An Outbreak of Febrile Pharyngitis and Conjunctivitis Associated with Adenoidal-Pharyngeal-Conjunctival Type 3 Virus Infection, New England J. Med. **251**: 1087-1090 (Dec. 30) 1954.

own homes, which for the most part were scattered throughout the Virginia part of metropolitan Washington. They traveled to and from camp daily, usually in one of 27 cars, which carried a median of six campers each. They brought their own lunch, and no meals were served at camp. Each of the 181 campers was assigned by age to one of nine groups of nearly equal size. Two adult counselors headed each group, which independently selected its own daily activity, ranging from field trips to arts and crafts activities. The two younger groups used the wading pool separately twice a day and seldom used the swimming pool. The seven older groups used the swimming pool separately for one-half hour periods every morning, and paired groups used it together in the afternoons. The swimming pool was filled at start of season with Alexandria city water, and this was continually recirculated through slow sand filters. It was chlorinated by hand when tests showed low residual chlorine. Tests were made by the camp caretaker routinely at least three times a day. On only a few occasions the caretaker found the residual chlorine to be less than 0.2 ppm; usually it was 0.5 or greater. The camp was connected with city water, and the number of bubblers was ample for drinking. Toilets, washrooms, and dressing rooms were ample in size and clean. Sewage disposal was by septic tank. Paper towels were amply available, and no common towels, drinking cups, or other utensils were used. Aside from the car pools, the paired groups for afternoon swimming, and the home contacts of campers, there was little person-to-person contact between the groups, except at the morning time of arrival and at a 10-minute assembly for communal singing just prior to departure at 3 p. m. Even in this the counselors tended to keep their group together and apart from others. Epidemiological group 2 embraced all family household associates of the camp children and camp staff.

The Broyhill, group 3, residential neighborhood outbreak occurred in a comparatively new housing development in a geographically distinct area located some seven miles northwest of the camp. The outbreak had no apparent relation to the camp outbreak. It was discovered through visits to patients referred by practicing physicians. During such visits, inquiry was routinely made as to contact with other known persons with the illness, and these contacts were visited insofar as time permitted. Through such hearsay information 25 cases were found with relative ease in this comparatively small area, and it was concluded that a neighborhood outbreak existed. This area had a community swimming pool used extensively by the neighborhood. The pool was relatively new and was of the recirculating type, with pressure sand filters and automatic chlorination. It was reported that frequent, routine, daily tests were made and that the residual chlorine had never fallen below 0.5 ppm and seldom below 0.6 ppm.

The Hollin Hills, Hollin Hall, and Tauxemont, group 4, neighborhood outbreak occurred in a geographically distinct residential area some five miles southeast of the camp. It was found through tracing neighborhood contacts of camp children with the illness. In July and early August, a number of secondary and tertiary cases were found in this area. An attempt was made to keep in touch with persons with the illness in this area, because two new swimming pools were nearing completion and one was to be opened late in August. Physicians known to serve the area cooperated by advising of persons with suspected cases. The pool opened Aug. 29, and school opened Sept. 1. To the dismay of citizens our vigilance was rewarded by a sharp outbreak, which occurred with its peak in the second week of September.

The sporadic cases, group 5, occurred throughout and beyond the metropolitan area, and seldom could any possible connection with any of the above noted outbreaks be traced. These cases are noteworthy because of their wide distribution. Some occurred in Maryland, some in the District of Columbia, some in Arlington and Falls Church, Va., and some as far away as Leesburg, Va.

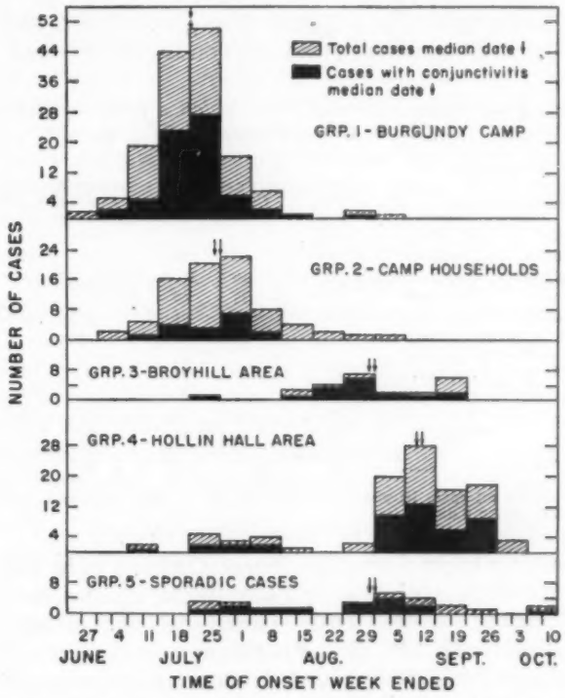

Fig. 1.—Time occurrence of cases according to epidemiological group.

PROCEDURES

Practicing physicians were kept informed of the situation and were the chief source of information leading to residential area outbreaks and sporadic cases. All patients who could be located during the acute stage of illness were visited in their home by one of us to obtain epidemiological data, to elicit signs and symptoms of illness, and to collect specimens for bacteriological, virological, and serologic studies. An effort was also made to collect specimens from well members of the household. Absentees from camp (and from school in the Hollin Hall residential outbreak) were checked daily by phone for presence of illness to enable prompt visit by one of us. Follow-up information was then obtained by revisit or by telephone. Family rosters were completed for all household associates of the camp children and camp staff and for most patients in the Hollin Hall (group 4) outbreak.

For virus study, eye swabs, throat swabs and washings, and anal swabs, and occasionally stool specimens, were collected in the maintenance medium used for HeLa tissue cultures and frozen in dry ice within 30 minutes after collection. Specimens were inoculated into HeLa cell roller-tube tissue cultures. The cultural and serologic techniques have been described elsewhere.[6] In brief the specimens for virus isolation were tested in a uniform manner, and all test groups included dual controls consisting of human specimens known to be either positive or negative. In the few instances where the positive controls showed no virus effect within 12 days, the test was discarded as unsatisfactory. Specimens were classified negative if no cytopathic effects occurred within 12 days. Specimens were classified positive if a viral agent shown serologically to be APC-3 virus was established in passage. All except one of the APC viruses found in this study were type 3. The exception was virus from a boy, age 6, who had a history of a typical illness, with fever, sore throat, and conjunctivitis, with onset on July 12. No specimens were taken during this illness. On Sept. 6, he had another illness, with fever and sore throat, no conjunctivitis, and huge, nonred tonsils. Throat specimens on Sept. 9, yielded type 1 APC virus. Specimens were collected on blood agar from the eyes and throats of 42 persons and studied bacteriologically for common eye, nose, and throat pathogens. To simplify presentation, the findings are described under three main sections, etiological observations, clinical observations, and epidemiological observations. The tables and charts often present data pertinent to two or more sections. They have been elaborated for this purpose, and cross references are common.

TABLE 2.—*Relation of Site of Virus Isolation to Occurrence of Cases with Conjunctivitis* *

Site of Virus Isolation		Total Cases, No. (100%)	Cases With Conjunctivitis		Cases Without Conjunctivitis	
Eye	Throat or Anal		No.	%	No.	%
Positive	Positive	33	29	88	4	12
Positive	Negative	10	10	100	..	..
Negative	Positive	30	12	40	18	60
Negative	Negative	28	6	21	22	79
Subtotals						
Positive	.....	43	39	91	4	9
Negative	.....	58	18	31	40	69
.....	Positive	63	41	65	22	35
.....	Negative	38	16	42	22	58
Total.....		101	57	56	44	44

* Includes all cases in which eye and throat or anal specimens were collected zero to 9 days after onset.

ETIOLOGICAL OBSERVATIONS

Table 1 shows that APC-3 virus was isolated from patients in each of three outbreaks and from one or more patients in each of the sporadic instances of disease occurrence. Thus, wherever and whenever the clinical disease was found to exist, APC-3 virus isolations were readily accomplished. This simple association between an illness and a specific virus that readily grows in test tubes through many generations does not in itself establish that this virus caused the illness. Ideally, it is desirable to show that this laboratory-grown virus reproduces the disease in susceptible animals, preferably in human beings. Common laboratory animals have not been found susceptible to APC-3 virus(chimpanzees have been infected without apparent illness), however, conjunctivitis developed in two humans after apparent accidental infection with APC-3 virus.[7] It is also important to know that the virus invaded the body tissues; that it was basically present in the lesions of the disease; that it was commonly present during the acute stage of the disease and for limited periods before or after the acute stage; that it was not so commonly present in well persons, even though effectively exposed to infection; and that it was not common in illnesses of a different nature. These associations are here reported.

The antibody response indicated that the virus was not an incidental noninvasive parasite. Paired serums from patients in the acute and convalescent stages of the illness were collected from 22 patients in whom cultures were virus positive and tested for rise in antibody titer. In the complement fixation test against type 1 and/or type 3 APC antigen, 15 of the 22 serums showed a fourfold or greater rise and 5 showed a twofold rise. Fifteen of the 22 were also tested for specific neutralizing antibodies with type 3 virus, and 13 showed a fourfold or greater rise. The two with no definite rise also showed no definite rise in the complement fixation test. In all, 20 of the 22 tested showed a fourfold complement fixation or neutralizing antibody response.

Table 2 shows the occurrence of virus in an active lesion of the disease. Of 43 patients with positive eye swabs, 91% had definite conjunctivitis and 9% did not. Of 58 patients with negative eye swabs, only 31% had conjunctivitis and 69% did not. Table 2 shows that these differences were not dependent on the presence of virus in throat or anal specimens. Thus, APC-3 virus was clearly associated with conjunctivitis. Table 3 shows the time relation of the occurrence of APC-3 virus and onset of illness. One or more specimens were collected from a total of 186 persons and satisfactorily cultured for virus. Specimens were collected from 15 persons a few days to a week or so before onset of illness, and, on test, only one yielded APC-3 virus. This was a throat specimen collected in the afternoon before onset of definite symptoms. Specimens were collected from 58 persons more than 10 days after onset of illness, and, on test, only one yielded APC-3 virus. This was a throat specimen collected 15 days after presumed onset. It is noteworthy that these data indicate that convalescent carriers of infection were not common. The remaining 113 persons had specimens collected zero to nine days after onset of illness, and it is striking that 78 persons (69%) yielded APC-3 virus. Table 3 also shows the number and type of specimens tested and the number of virus recoveries among the 80 ill persons in whom at least one specimen was virus positive. Virus was recovered with equal ease from throat washings and throat swabs. The throat specimens were all positive during the first two days of illness, and the percentage positive progressively decreased thereafter. On the other hand only one-third of the eye specimens were positive on the first two days of illness. This apparent difference in time of occurrence of positive isolations in throat and eye specimens might be due to a delayed occurrence of conjunctivitis in some cases. In all, suc-

6. Footnote 1*a* and *c*.
7. Footnotes 1*c* and 5.

cessful virus isolations were seldom, if ever, made before onset or after recovery from illness but were commonly made in decreasing proportions during the first nine days after onset of illness.

Table 1 shows that the virus was isolated from 80 persons who were ill and could not be isolated from 84 persons in whom no illness developed. This is striking and shows that in this experience the virus was 100% associated with illness. This could be misleading unless the well persons were known to have been exposed to infection. Twenty-two of the 84 well persons had intimate family household exposure to a person in whom

TABLE 3.—*Number and Percentage of Persons in Whom Specimens Were Positive for APC-3 Virus, According to Time of Onset of Illness* *

Persons Tested †	Time Specimen Collected: Before Onset	Days After Onset: Zero-1	2-5	6-9	10+	Total
No.	1/15	16/26	53/67	9/20	1/58	80/186
%		62	69	45		
Specimens Tested in 80 Virus Positive Cases						
Eye	0/3	6/18	36/53	7/14	0/8	49/96
%		33	68	50		
Throat	1/6	17/17	53/66	3/20	1/7	75/116
%		100	80	15		
Anal	0/1	6/7	7/12	2/2	0/1	15/23
%		86	58			

* Numerator, number positive. Denominator, number tested.
† Persons with repeated tests tabulated by test nearest date of onset.

cultures were virus positive, and 26 had similar exposure to other persons with clinically definite cases. Specimens from these persons were collected during or close to the infectious period of acute illness in their associate. Since, as will be shown later, the disease developed in a high proportion of such household contacts, most, if not all, of these contacts must have been exposed. The remaining 36 of these 84 persons were camp children or neighborhood contacts or other persons with specimens collected during the time when infection was likely. All these persons had an excellent opportunity to be infected. The fact that illness did not develop in them and that demonstrable virus infection was not found in this experience indicates that clinically inapparent infections were not prevalent. This, together with the epidemiological evidence discussed later, which shows that cases were easily traceable to the person's prior contact with other persons with the illness, supports the view that healthy human carriers in the exact sense of the term were certainly not as common as in diseases such as poliomyelitis and diphtheria. This is an important element in the chain of evidence (association of virus and disease) that supports a cause and effect relationship.

It is important to know not only that the virus was associated with illness but, more specifically, that it was associated with a particular clinical syndrome. As shown in a previous report [1b] APC-3 virus was not associated with 141 acute illnesses that were not characterized by conjunctivitis and fever. These illnesses had a variety of clinical diagnoses and included many common febrile diseases of children. The occurrence of conjunctivitis, frequently monocular, which is commonly associated with a four to six-day febrile illness, is quite distinct from other disease entities. Derrick [8] thought it sufficiently different to report three cases, and Cockburn [4] reported an epidemic. As mentioned earlier, some of Cockburn's cases have now been shown to be associated with APC-3 virus. Also, two previous reports [8] showed APC-3 virus associated with conjunctivitis and fever. In addition, Neva [9] reported a febrile illness with conjunctivitis, and APC-3 virus was isolated. In the present study, three distinct outbreaks and a number of sporadic cases associated with APC-3 virus were independently recognized clinically through common association of conjunctivitis and fever. Many of the practicing physicians who referred patients with unusual cases to us for study were not previously alerted to the existence of the syndrome in this area and did not know we were studying the disease. In this study, a total of 52 persons had both fever and conjunctivitis; cultures were taken zero to nine days after onset of illness, and APC-3 virus was isolated from all but 6. Thus, APC-3 virus was commonly associated with a particular clinical entity to be described. In a person-to-person spread, respiratory disease, when the host-parasite relations involve few, if any, healthy carriers, the above-detailed associations of virus with a specific illness constitute an array of evidence that could hardly occur unless the specific virus is the cause of this particular disease.

CLINICAL OBSERVATIONS

The analysis of the clinical symptoms, signs, duration, and severity of the disease must take into consideration the method of collection and ultimate adequacy of the data available for this specific purpose. Clinical observations were made almost exclusively through home visits by us, and follow-up visits were infrequent. Thus it was impractical to obtain blood and urine tests and to obtain complete, detailed, day-to-day records of the evolution of clinical manifestations such as might be obtained in a hospital. The clinical conclusions presented here relate to exclusively virus positive cases. However, the percentage occurrence of various clinical manifestations of non-laboratory-confirmed illness is indicated in the tabular data.

TABLE 4.—*Percentage of Virus Positive Patients with Fever, Conjunctivitis, or Sore Throat and Percentage in Non-Laboratory-Confirmed Illnesses, According to Intimacy of Contact with a Virus Positive Case*

Intimacy of Contact with Virus Positive Case	Total Cases, (100%)	Patients with Fever: No.	%	Patients with Conjunctivitis: No.	%	Patients with Sore Throat: No.	%
1. Virus positive cases	80	72	90	53	66	56	70
Non-laboratory-confirmed cases							
2. In household with virus positive case	48	39	81	16	33	33	69
3. Other contact with (1) or (2)	124	111	90	42	34	90	73
4. Others	130	118	91	51	39	90	69
Total	382	340	89	162	42	269	70

Table 4 shows the number and percentage of cases in which there was fever, conjunctivitis, or sore throat—the chief signs of the disease. The virus positive cases are

8. Footnotes 1*b* and 5.
9. Neva, F. A., and Enders, J. F.: Isolation of a Cytopathogenic Agent from an Infant with a Disease Resembling Roseola Infantum, J. Immunol. **72**: 315-321 (April) 1954.

shown first and the non-laboratory-confirmed cases, for the most part in patients not tested, are grouped according to intimacy and directness of known contact with a virus positive case. Of the virus positive cases, in 90% there was fever, 66%, conjunctivitis, and 70%, sore throat, and, not shown in the table, in 68% there was headache and in 72% lassitude. This percentage distribution of symptoms was similar in various age and sex groups. It is noteworthy that all of these symptoms except conjunctivitis were distributed in near equal proportions among virus positive cases and non-laboratory-confirmed illnesses regardless of intimacy of contact with a virus positive case. Conjunctivitis, on the other hand, occurred in two-thirds of the virus positive cases as compared with only one-third in non-virus-positive cases. The difference was in a large part due to the greater likelihood of recovering virus from a patient with conjunctivitis (see table 2). This was true no matter whether the virus isolation attempt was made from eye or from throat or anal specimens. Thus, a similar near equal distribution of conjunctivitis among patients in whom cultures were positive and other patients could not be expected.

The incidence of various combinations of the chief clinical manifestations in the 80 virus positive cases was: fever without conjunctivitis or sore throat in 9 cases (11%), with conjunctivitis alone in 9 cases (11%), with sore throat alone in 17 cases (21%), and with sore throat and conjunctivitis in 37 cases (46%). Of the cases not definitely febrile, sore throat occurred alone in one case, conjunctivitis alone in six cases (8%), and both conjunctivitis and sore throat in one case. This shows the wide variations in the symptom complex and shows the difficulty of clinical recognition of an individual case without conjunctivitis that is not associated with cases in which there is typical conjunctivitis and fever. Cases without conjunctivitis occurred in 34% of the patients observed in whom cultures were positive.

A description of the nature of the disease includes details of clinical impressions based on patients in whom cultures were positive who were medically examined in more detail than was possible for the bulk of the patients observed. The fever not uncommonly spiked to 103 or 104 F for a few days and subsided by lysis. It lasted from 1 to 10 days (the median was 5 to 6 days), and was often the chief complaint. The sore throat was generally quite mild and was described more as a discomfort or scratchiness rather than painful deglutition. Examination of the throat generally showed nothing striking except that the posterior oral pharnyx was frequently injected and prominently studded with glary lymph follicles. Nontender, submaxillary lymphadenopathy was common even in the absence of the sore throat complaint.

Conjunctivitis lasting a few days to less than three weeks was manifest by injection of both the bulbar and palpebral conjunctivas. The conjunctivitis was of the mild follicular type, frequently monocular. Nontender, preauricular lymphadenopathy was occasionally noted. A purulent exudate was almost nonexistent, but a scanty, serous exudate, with some slight matting together of the eyelids and excessive lacrimation, was not uncommon. Eye redness and minor discomfort was occasionally the chief complaint. Photophobia and retro-orbital pain were almost nonexistent. Ophthalmologic examinations of many persons with acute cases and of a total of 37 patients several weeks after recovery showed no evidence of corneal or uveal tract involvement.

No deaths have occurred, and no sequelae have been recognized. Otitis media may be a complication or it may be part of the disease. It occurred infrequently and was usually nonpurulent and did not seem to respond well to antibiotics. Blood and urine from patients in the Clinical Center outbreak showed no remarkable abnormalities other than possible leukopenia.[6] Headache was a common symptom, and listlessness, particularly drowsiness, toward the end of the febrile illness seemed to be quite common. Cough, chest findings, and skin rashes were practically nonexistent. Nausea, vomiting, diarrhea, and epistaxis occurred only in a few cases. Jaundice did not occur. Muscle, bone, and joint aches and weakness occasionally occurred, particularly in adults.

Differential diagnosis should consider leptospirosis, influenza, herpangina, and various nonpurulent conjunctivitides. The clinical picture is not that of leptospirosis, but the fever, headache, nonpurulent conjunctivitis, and the possible association with swimming demand consideration in differential diagnosis. The patients studied did not have severe malaise; headache; muscle, bone, and joint ache; vomiting; and stiff neck and did not have the jaundice often seen in cases of leptospirosis. In addition, the conjunctivitis in the patients studied was generally of longer duration, and no deaths occurred. Epidemiologically, leptospirosis would hardly be expected to occur in so many areas with such good sanitation, and secondary household cases are not common. Agglutination-lysis tests for leptospirosis with Lept. icterohaemorrhagiae, Lept. canicola, Lept. autumnalis, Lept. grippotyphosa, and Lept. pomona antigens gave no positive reactions and gave negative reactions in 21 serums tested from 17 patients in whom cultures were positive and 4 in whom they were not. Three, 4, 4, and 10 of these serums were collected, respectively, during the first, second, third, and fourth weeks after onset of illness.

The rather sharp outbreaks of acute febrile illness suggest influenza. The patients studied did not generally have the muscle, bone, joint, and retro-orbital pains and aches common with influenza, but they commonly had conjunctivitis, which is definitely not common in influenza. Epidemiologically, influenza outbreaks are rare in the summer months. Specimens from 16 patients (12 were positive for APC-3 virus) were negative for influenza virus types A and B. Only 10 of these specimens were collected within six days after onset. Herpangina is a common disease that occurs during the summer months. Several cases of this disease were observed during the study and not included as study cases. Clinically, the characteristic lesions of herpangina on the palate and anterior pillars serve for diagnosis. Stool specimens from 16 patients (11 were positive for APC-3 virus) were tested, and only one was positive for Coxsackie virus. This one patient also had APC-3 virus. One positive reaction out of 16 could be expected for this time of year in persons without a clinical diagnosis of herpangina.[10]

Of the nonpurulent conjunctivitides, epidemic keratoconjunctivitis and inclusion conjunctivitis are to be considered in differential diagnosis. Neither of these are commonly associated with general symptoms or have such short duration as found in the study cases. In addition, no involvement of the cornea was found by ophthalmologist consultants, in either patients with disease in the acute stage or those in late convalescence, and scrapings from the conjunctivas of six patients in whom cultures were positive showed no inclusion bodies when stained by Macchiavello's stain. Hemophilus influenzae, H. hemolyticus or beta hemolytic streptococci were isolated in 3 out of 15 patients with no conjunctivitis and in one out of 27 patients with conjunctivitis, indicating no relation between conjunctivitis and these bacteria. A physical or chemical irritation of the eye would not have been so commonly accompanied by fever and would not be followed by secondary cases in the household to the extent that occurred with this disease.

EPIDEMIOLOGICAL OBSERVATIONS

Of the 382 persons with the illnesses observed, specimens were obtained from 113 in the first 10 days of illness. Although in nearly 70% of the 113 persons specimens were virus positive, 80 positive cases are too few to permit substantial and reliable deductions on incubation period, person-to-person spread, and other epidemiological attributes. Sound deductions are not likely even if all clinically typical cases are so used, because this would still knowingly omit many definite cases. As previously indicated, with present knowledge perhaps a third or even half the virus positive cases would not be clinically identifiable in the absence of associated typical cases. It would be difficult to trace a chain of human infection when many links are missing. Thus it seems best to use all 382 observed patients with the illness for epidemiological analysis in full recognition of the fact that these may include a few with illnesses of different origin.

It appears that a high proportion of the 382 cases were of the same origin because: 1. The cases selected for study constituted all cases of conjunctivitis and all patients with fever or sore throat (excluding illnesses of obvious origin, e. g., measles, herpangina or roseola) that were found in association with the epidemic outbreaks or were found in household association with likely clinical cases. Since most of the observations were made exclusively during comparatively brief periods of rather sharp outbreaks in stable population groups, and, since the incidence of illness was unusually high (70% of camp children were attacked within a few weeks' time), it seems likely that nearly all such cases must be of the same origin. Such sharp outbreaks of infectious diseases are characteristically due to a single agent. 2. The nature and percentage of clinical manifestations (previously described, table 4) were similar in virus positive cases and non-laboratory-confirmed cases, by age group and sex, and by epidemiological groups selected on basis of intimacy and directness of known contact with a virus positive case. 3. The time occurrence of cases with and without conjunctivitis. In figure 1 total cases compared with number of patients with conjunctivitis showed almost precisely the same time occurrence. This was repeated in each epidemiological group, indicating that conjunctivitis and the febrile illness certainly must be part of the same disease. All in all, the occurrence of disease due to APC-3 virus would not preclude the occurrence of other illnesses, but, in the special circumstances of this study, all evidence indicates that the bulk of cases here reported were of the same origin.

Incubation Period.—The incubation period may be nicely determined through multiple instances wherein a well child has a single brief exposure to a child ill with a communicable disease and the same disease later develops in the well child. No such ideal instances were found in this study. Thus, the probable incubation period has been determined through instances of interhousehold contact in areas where the disease was not prevalent and by intrahousehold observation of the interval between

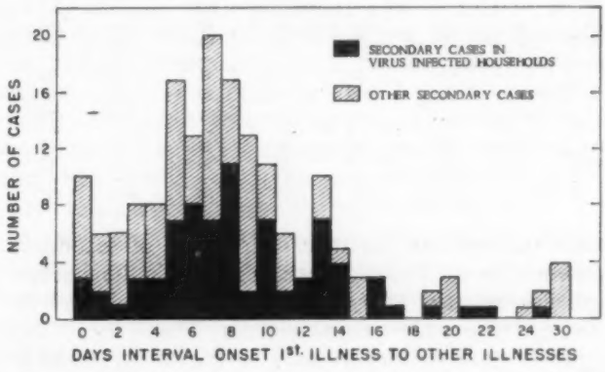

Fig. 2.—Interval from onset of first case in household to onset of other cases.

onset of first and other cases within the household. In a Maryland neighborhood of metropolitan Washington where no epidemic existed, the typical illness developed in a 12-year-old boy, patient A, on Aug. 29, and his was the only case in his household. He played frequently with B and C, age 12 and 9 years, who lived across the street, in both of whom the illness developed on Sept. 6 and 7 respectively. In this instance, eight days was the maximum incubation period. Patient A had no known contact with patient D, age 11, who lived on another street in back of B's and C's household. D frequently played with B and C, and a virus positive case developed in him on Sept. 12. In this instance the maximum incubation period was six days. In another area where there was no epidemic, typical cases developed in sibling patients E and F, age 7 and 4 years, on July 22 and 27. Patient E had a virus positive case. He attended the camp where the disease was epidemic. The illness developed in their next door home playmates, patients G, H, and J, ages 1, 5, and 7 years, on July 31, Aug. 3, and Aug. 5, and virus was isolated from H and J. This indicates a maximum nine-day incubation period. In still another area where the disease was not prevalent, virus positive cases de-

10. Huebner, R. J., and others: Medical Progress: The Importance of Coxsackie Viruses in Human Disease, Particularly Herpangina and Epidemic Pleurodynia, New England J. Med. 247: 249-256 (Aug. 14) 1952; 285-289 (Aug. 21) 1952.

veloped in patients K and L, ages 10 and 12 years, with onset Aug. 4 and 9; their cousin, age 10, from New York, visited in their home from July 29 to Aug. 3. Typical illness, with conjunctivitis, developed in the cousin on July 29, and he had fever throughout his visit. This is compatible with an incubation period of six days.

The incubation period is also indicated by the time intervals of intrahousehold spread of the disease. The intervals between onset of first case in a household and onset of other cases is shown in figure 2. It would appear that an assumed incubation period of 5 to 9 or 10 days

TABLE 5.—*Eleven Week Attack Rates in Burgundy Groups 1 and 2 and Total Cases Observed in Groups 3-5, by Age and Sex*

			Burgundy Groups 1 and 2			Groups 3-5	
	Age	Sex	Persons	Cases	Attacked, %	No. of Cases	Total No. of Cases
	0-4	..	65	24	37	27	51
	5-9	..	172	124	72	66	190
Sub-total	0-9	M	134	82	61	57	139
	...	F	103	66	64	36	102
	10-19	..	66	29	44	35	64
	20-39	..	200	41	20	21	62
	40+	..	135	10	7	5	15
Sub-total	10+	M	198	29	15	29	58
	...	F	203	51	25	32	83
Total			638	228	36	154	382

would best explain the time distribution of secondary household cases. The cases occurring within the first few days after onset of illness in the first case might well be instances of extrahousehold contact. The 5 to 10 day spread of peak occurrence may be due to variations in incubation period or due to variations in time of effective contact. No evidence is available on the former, but, assuming the range to be narrow, some interesting observations follow. Since household associates would not necessarily have effective contact on the first day of occurrence of first case, it would appear that the most probable incubation period was about five to seven days. It is interesting that figure 2 suggests clustering of cases at rough multiples of six to seven days. It is also interesting that in figure 1 a six-day interval elapsed from the median date of illness occurrence in the Burgundy campers and the median date of such illness in their household contacts. All available data could be explained on a five to seven day incubation period.

Period of Communicability.—The period of communicability is suggested by the time relations between recovery of virus and onset of illness. Since all except two virus isolations were made during the first 10 days of illness, this would appear to be the period of communicability. Assuming a usual incubation period of 6 days (5 to 7), and a 10-day period of communicability and a highly infectious disease to the extent that susceptible household contacts would be infected from the first household case, then 16 days should be the common maximum interval between onset of first and last case in a household. It is noteworthy that when dealing exclusively with cases in virus-infected households, only 5 out of 67 had an interval of greater than 16 days from first case. Only one had conjunctivitis, and three of the five were adults. Thus, in the usual stable family group, comparatively few new cases are likely to occur more than 16 days after onset of the first case.

Infectiousness, Immunity, and Susceptibility.—Infectiousness, immunity, and susceptibility may be reflected in total attack rates and secondary household attack rates. Table 5 shows by age and sex the total attack rates for Burgundy groups 1 and 2 (the only groups in which a preselected general population group was studied) and, incidentally, case distribution of groups 3 to 5. Table 6 similarly shows the secondary household attack rates among all persons exposed to an initial household case and observed for three weeks thereafter. The rates by age and sex were similar for Burgundy and other households. It will be noted that the attack rates in each table show a similar pattern by age and sex. The fact that about 60 to 70% of all children (not just susceptible persons) from birth through 9 years of age were attacked indicates that the disease was rather highly infectious.

The progressively decreasing attack rates in the older age groups probably reflects a greater proportion of immune persons. The birth to 4-year-old age group had significantly lower attack rates than the 5 to 9 year group. The secondary household attack rates for the age group from birth to one year was 20% (4 in 20) and for 2 to 4 year olds was 44% (19 in 43). Thus, possible, passive maternal immunity and/or less opportunity for household exposure in the crib, creeper, and toddler ages (as has been shown for pertussis[11]) may accout for some but not all of the lower attack rate in the age group from birth to 4 years. The remainder of the difference is not satisfactorily explained but may possibly be due to

TABLE 6.—*Secondary Household Attack Rates During Three Week Period Following Onset of First Household Case, by Age and Sex*

			First Household Case	Persons Exposed to First Household Case		
	Age	Sex	(Excluded)	Persons	Cases	Attacked, %
	0-4	..	13	63	23	36
	5-9	..	112	78	50	64
Subtotal	0-9	M	68	80	40	50
		F	57	61	33	54
	10-19	..	30	52	17	33
	20-29	..	17	206	31	15
	40+	..	4	126	8	6
Subtotal	10+	M	29	185	16	9
		F	22	199	40	20
Total			176	525	129	24

less opportunity for young children to have additional exposure outside the household or to a greater likelihood of overlooking mild cases at the younger ages.

The sex difference is striking. There was no significant difference in attack rates by sex in the age group from birth to 9 years of age. At older ages, 20% of females exposed in a household were attacked, whereas only 9% of the males were attacked. The obvious inference is that in the family household older females were either more susceptible, or more exposed, or both. As a group, adult females spend more time at home and are more

11. Bell, J. A.: Norfolk Pertussis Studies, unpublished data.

apt to nurse the sick than males. On the other hand, males do spend considerable time at home, and, since the disease appears to be rather highly infectious, it would seem that males should have been fairly effectively exposed. It is questionable whether the greater exposure of females could account for all the rather large difference in attack rates. The near equal sex distribution of total cases, 197 males and 185 females, is noteworthy. It is possible that males were more apt to be exposed outside the household, and, thus, over a period of years may have acquired more adult immunity. In support of this, serologic studies of adults over 34 years of age from the Washington, D. C., area showed that males were more likely to have antibodies against APC-3 virus[12] than females. As with some other diseases, the sex difference is not satisfactorily explained and may be due to several factors.

Outbreaks.—The Hollin Hall and Broyhill outbreaks are important from the standpoint that neighborhood outbreaks do occur, both were apparently independent of each other, and each occurred in an area having a new, modern, well-chlorinated swimming pool. These neighborhoods were relatively new residential areas, and they were not low-cost housing projects. As shown in figure 1, the Broyhill outbreak occurred when school was not in session. In the Hollin Hall area, a few scattered cases occurred in July and early August, and the new swimming pool was officially opened Aug. 29; however, it is rumored that swimming actually occurred for a few days prior to official opening. School opened on Sept. 1, and the peak of the outbreak occurred during the week of Sept. 12. Total population groups were not observed in these areas, but the secondary household attack rates were not essentially different from those in the Burgundy experience. The sporadic cases have been previously discussed.

A general description of the Burgundy summer day camp and of its practices has been given. Figure 1 and table 1 show the general nature of the outbreak. Within the six-week camp period, nearly 70% of the 203 campers and staff were attacked. In time and extent, this is comparable to the not uncommon person-to-person spread influenza outbreaks in schools and institutions. It is not comparable to single common source outbreaks of food poisoning in institutions. The repeated ease with which cases could be traced, particularly in nonepidemic areas, to some five to nine day prior personal contact with another case is good evidence of person-to-person spread of this disease. In addition, the occurrence of secondary cases in various households of campers far removed from the camp, and the nature of spread within these households, would be difficult to explain except on a basis of person-to-person contact spread. That such spread is likely is indicated by the presence of the virus in the throat secretions of infected persons. Many infectious agents found in throat secretions in other diseases are commonly spread by personal association either directly by droplets or indirectly by articles freshly contaminated with such secretions. Thus, it is reasonable to believe that this disease was so spread; however, this does not preclude the additional occurrence of other methods of spread. The facilities and method of conduct of the camp as previously described do not arouse suspicion of contaminated drinking water, food, milk, utensils, or towels. The camp did maintain a dog, horse, calf, goat, and some fowl, but none of these had undue illness or mortality. Stool specimens from the calf and horse were negative for virus, and blood samples showed no antibodies against APC-3 virus. Rigid fly control was maintained, and few flies were present. No mosquitoes were found; they were not prevalent. Gnats were not prevalent, but a few were found swarming over dung.

The swimming pool was the chief inanimate common contact of the campers. Several samples of water from the Burgundy pool and from other pools in the Hollin Hall and Broyhill areas showed no APC virus, but it is highly probable that samples were not obtained when the chlorine content was low. Aside from young children, a large proportion of the persons interviewed had been swimming some time or other during the summer, and no satisfactory index was available to determine whether persons who had been swimming were attacked to any greater extent than those who had not. Of the patients who had been swimming during the two-week period prior to onset, 45% (97 in 216) had conjunctivitis, whereas, of those who had history of no such swimming, only 30% (13 in 44) had conjunctivitis. Perhaps swimming had something to do with the occurrence of conjunctivitis among infected persons.

As described, campers were assigned by age to one of nine groups, each group having two adult counselors. Within each group there was considerable personal contact, but, between the groups, the chief contact consisted of the paired groups for afternoon swimming and the car pools. The first case occurred in an older age group, no. 8. Five days later, a case occurred in group no. 6 and, the next day, cases occurred in groups 2, 3, and 7. The date of onset of the median case in the four older groups was July 15; in the three next younger age groups, July 18; in the two youngest age groups, July 24; and in the camp staff, July 21. The attack rate in the two younger groups was 51% (18 in 35), whereas in the next older groups it was 83% (45 in 59), while in the oldest campers' groups, 6 to 9, it was 74% (64 in 87), and in the adult camp staff, 50% (11 in 23). Groups 1 and 2, the youngest age groups, did not ordinarily use the swimming pool and had the lowest attack rate and were the last to become infected.

The intervals between onset of first and other cases in camp groups, car pools, and households were compared. The percentage of cases occurring in consecutive five-day groups was computed. For the first 20 days, the percentage distribution in order for the camp groups were 8, 24, 25, and 25%; for the car pools, 15, 32, 28, and 12%; and for households 24, 47, 17, and 6%. It would appear, assuming a five to nine day incubation period, that the household was the most important place of spread, the car pools next, and the camp groups least important of the three. The time and rate of occurrence of cases at the camp, when considered with the excellent camp facilities and method of camp conduct, suggests the possibility that the swimming pool may have been

12. Rowe, W. P.; Hartley, J. W., and Heubner, R. J.: Unpublished data.

contaminated and a possible source of infection accessory to a person-to-person mode of spread; however, there exists no incriminating evidence.

The dates and times during which the chlorine content of the Burgundy pool was low are unknown, but the Hollin Hall and Broyhill outbreaks seemed also to have some association with swimming pools, and records on these newer pools showed no periods of low residual chlorine. In addition, the presumed cases reported by Derrick [3] and the epidemic reported by Cockburn [4] were associated with swimming pools. The resistance of APC-3 virus to chlorine is not known.

COMMENT

The chief objective of study was to collect epidemiological evidence as to whether APC-3 virus was the causative agent of a definable disease. In addition, data were collected insofar as possible to shed light on the chief epidemiological characteristics. The data at hand permit many deductions, but this first localized study of a newly recognized disease entity will not permit finite conclusions on its general characteristics. The general prevalence and general mode of occurrence of this disease are unknown. It is possible that this is a relatively new disease in this area [1b]; possibly it is a common, widespread disease generally prevalent, and swimming may have enhanced the occurrence of conjunctivitis, thus permitting the disease to be here recognized. Further search for the disease in different areas under different circumstances will give a broader picture of its clinical and epidemiological nature. The characteristics of the disease as first identified are here reported without generalization, because this first experience with the disease could not be expected to demonstrate all of its characteristics.

SUMMARY AND CONCLUSIONS

These studies have presented evidence that APC-3 virus (1) invaded tissues of infected persons; (2) was present in a lesion regardless of its presence in other tissues; (3) was not present in well persons, even those who were intimate contacts of a patient with the illness; (4) was present almost exclusively during the acute illness and was rarely found before onset or after recovery; (5) was associated with a particular clinical syndrome and not with other common illnesses; and (6) was found in similar clinical illnesses in three distinct outbreaks and in sporadic cases widely distributed throughout the study area. The disease was characterized chiefly by fever, often spiking to 104 F and usually lasting four to six days; pharyngitis, commonly with a mild sore throat complaint; and conjunctivitis of nonpurulent, follicular type, often monocular and commonly lasting one to three weeks. Although fever occurred in nine-tenths of cases, pharyngitis in two-thirds to three-fourths, and conjunctivitis in one-third to two-thirds of the cases, these symptoms occurred either alone or in any combination. Until further studies are done, it is estimated that one-fourth to two-fifths of cases would not be clinically recognizable if seen alone and not in association with typical cases.

The disease occurred in localized epidemic and in sporadic form, in all age groups but predominantly in children, and in both sexes. The mode of occurrence suggested that (1) infected human beings were a common source of infection, (2) infection generally produces illness (always in this experience), (3) healthy carriers were not an important source of infection, (4) the disease was rather highly infectious for young contacts, (5) older persons were more likely than children to be immune presumably from previous attack, (6) contaminated swimming pools may be a suspected but unproved source of infection. The observations indicate that the incubation period is probably five or six days and that the period of communicability as indicated by presence of virus decreases from 100% during the first few days of illness to practically nil after the ninth day of illness. The usual prevalence of the disease is unknown, although it has probably been recognized since 1943. It has occurred in the winter with perhaps a milder type of conjunctivitis, and it is probably a common, widespread respiratory disease. No studies were carried out on prevention or treatment, but we gained the clinical impression that the various antibiotics used did not influence the course of the disease.

Study of the clinical, etiological, and epidemiological attributes of a newly recognized communicable disease entity has appeared to differentiate one disease entity from the poorly defined mass of undifferentiated respiratory illnesses generally known as the common cold, catarrhal fever, nonstreptococcic sore throat, or acute respiratory disease. We suggest that this disease entity be named pharyngoconjunctival fever.

National Institutes of Health (14) (Dr. Bell).

Intestinal Intubation.—The intestinal tube to withdraw gases and liquids from the bowel has a great many uses in modern surgery. It is probably the most effective method of treatment of adynamic ileus secondary to extra-intestinal trauma, peritonitis, cholecystitis, spinal injuries, trauma of abdominal operations or pneumonia. . . . The most common complication of intestinal intubation is a disturbance in the fluid and electrolyte balance induced by indiscriminate aspiration. Dehydration, hypochloremia and the alkalosis may develop in the course of therapy. Although other complications are not common, some which can occur are serious and distressing. Laryngeal obstruction is one of the most serious; a pressure necrosis of the anterior wall of the esophagus occurs near its attachment to the body of the cricoid cartilage. Perichondritis and ulceration of the mucous membrane of the adjacent cricoid cartilage follows, with consequent acute subglottic stenosis of the larynx. A tracheotomy then becomes necessary. Fatal hemorrhage from rupture of esophageal varices following prolonged contact of a tube with these varices has been reported. Other reported complications are rupture, ulceration or stricture of the esophagus, rupture of the stomach or small bowel, sinusitis, otitis media, knotting of the tube, inability to withdraw the tube and breakage of the mercury filled bag. On rare occasions it is difficult or impossible to withdraw the tube. This is particularly true if the tip of the tube has passed through the ileocecal valve. Should this occur patience will usually effect a successful outcome. Leaving the tube in place and attempting its removal an hour or so later will frequently allow it to be dislodged and withdrawn. If one is still unable to withdraw it at this time continued forceful effort might result in tearing the intestine or its mesentery. It is, therefore, wiser to cut it off at the nose and to allow it to pass down through the intestine. The tube may remain in the intestine for many days before passing out through the rectum and anus.—D. H. Wagner, M.D., Intestinal Intubation: Techniques, Safeguards, Complications, *Surgical Clinics of North America*, February, 1955.

CONTROLLED CLINICAL TRIAL OF EFFECTS OF ALEVAIRE MIST ON PREMATURE INFANTS

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and
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It has been suggested that premature infants who develop respiratory obstructive signs in the first few days of life may be benefited by an environment that is saturated with various amounts of water. Potter [1] has stated that the incidence of hyaline-like membrane in the lung was reduced when newborn infants were raised in atmospheres of 90 to 95% relative humidity. Gellis and Hardy [2] have indicated a possible prophylactic effect on pulmonary hyaline membranes of atmospheres supersaturated with water. More recently Ravenel [3] has advocated the use of a detergent solution, Alevaire, consisting of Triton WR-1339 (oxyethylated tertiary octylphenol-formaldehyde polymer) 0.125%, glycerine 5%, and sodium bicarbonate 2% in distilled water, for nebulization into the incubators of all premature infants to combat neonatal asphyxia due to the inhalation of amniotic fluid, with or without atelectasis. Despite rational theoretical considerations and favorable clinical impressions about the effectiveness of these measures, no acceptable proof has been advanced to establish the existence of a positive therapeutic benefit. It was the purpose of this study to conduct a controlled clinical trial of the relative effectiveness of an Alevaire mist atmosphere as opposed to standard operating conditions within incubators in the Babies Hospital premature nursery (90 to 100% relative humidity) during the first 72 hours of life after premature birth.

MATERIAL AND METHODS

From May, 1953, through March, 1954, 203 infants were admitted to the premature nursery of the Babies Hospital. Three infants were excluded from the study at the time of their admission to the nursery and were placed in incubators at standard operating conditions; all survived to be discharged alive from the nursery. Two hundred infants were enrolled in the study and were assigned to Alevaire and control regimens at the time of admission to the nursery according to the decision contained in each of a series of prearranged sealed envelopes. The order of assignment had been determined in advance for three birth weight groups (1,000 gm. and less, 1,001 to 1,500 gm., and 1,501 gm. and over) by means of Tippett's random sampling numbers.[4] Thus, there was no prior knowledge of the treatment category to which each infant would be alloted at the time of admission to the nursery. Except for three above-noted exceptions, when each infant entered the nursery a sealed envelope was drawn in consecutive order from the appropriate birth weight series. The envelope was opened, exposing a gummed label upon which the treatment assignment was designated. Once assigned, the infants remained, without exception or deviation, upon the prescribed regimen.

Infants assigned to the group treated with Alevaire were placed in Isolette incubators. Alevaire was nebulized by means of oxygen flowing at the rate of 6 liters per minute through a Vapojette nebulizer (collar position 1). This was administered unchanged until the infant was 72 hours old and resulted in a mean rate of nebulization of 46.6 (standard deviation [S. D.] ± 22.3) cc. of Alevaire per hour. Those assigned to the control group were placed in Isolette incubators with oxygen introduced at a rate of 2 liters per minute; relative humidity ranged between 90 and 100% (Serdex hygrometer readings). Oxygen concentrations were measured in all incubators with a Beckman oxygen analyzer three times per day, and comparable concentrations (range 34 to 48%) were obtained in incubators for both treated and control patients. The conditions of the trial were terminated when each surviving infant was 72 hours old.

EFFICACY OF MIST PRODUCED

The previous reports on the therapeutic effects of Alevaire have described its use in an Armstrong incubator with a De Vilbiss nebulizer.[5] There is evidence that the aerosol environment produced by the equipment used in this study was comparable to that produced by other devices. A sleeping 1,350 gm. infant, aged 7 days, was exposed for three hours to a mist generated from a 5% solution of sodium sulfadiazine in Alevaire, first in an Isolette incubator with a Vapojette nebulizer and 24 hours later in an Armstrong incubator with a Vaponephrin nebulizer. Comparable blood levels of sulfadiazine were achieved (fig. 1). It seems reasonable to assume that, since the absorption curves were identical, mist droplets were being deposited in the respiratory tree of the infant in a comparable manner in both chambers.

As further evidence of the efficacy of the mist produced, it was found that in the group treated with Alevaire there was a reduction in the initial weight loss of infants weighing less than 1,251 gm. at birth (who had received no oral feedings before age 72 hours). In the first three days of life these small infants who were raised in the Alevaire environment (29 infants) sustained a mean loss of 27.8 (S. D. ± 20.6) gm. per kilogram of admission weight per day, as opposed to infants in the same birth weight category under control conditions (23

From the Babies Hospital and College of Physicians and Surgeons, Columbia University.

Read before the 24th Annual Meeting of the Society for Pediatric Research, Buck Hill Falls, Pa., May 5, 1954.

1. Potter, E. L.: Pathology of the Fetus and the Newborn, Chicago, Year Book Publishers, 1952, p. 252.

2. Gellis, S. S., in Pulmonary Hyaline Membranes: Report of the Fifth M & R Pediatric Research Conference, Columbus, Ohio, M & R Laboratories, 1953, p. 84. Hardy, J.: ibid., p. 86.

3. Ravenel, S. F.: New Technique of Humidification in Pediatrics, J. A. M. A. **151**: 707 (Feb. 28) 1953.

4. Tippett, L. H. C.: Random Sampling Numbers, Tracts for Computers, no. 15, London, Cambridge University Press, 1927.

5. Miller, J. B., and Boyer, E. H.: A Nontoxic Detergent for Aerosol Use in Dissolving Viscid Bronchopulmonary Secretions, J. Pediat. **40**: 767, 1952.

infants), whose mean loss was 40.8 (S. D. ± 21.7) gm. per kilogram of admission weight per day

Difference ÷ Standard Error$_{Difference}$ = 2.2 Standard Errors [S.E.]

This finding is consistent with observations recently reported by O'Brien, Hansen, and Smith [6] in infants exposed to fogs produced in Armstrong incubators by Mist-O_2-Gen nebulizers and strengthens the presumption

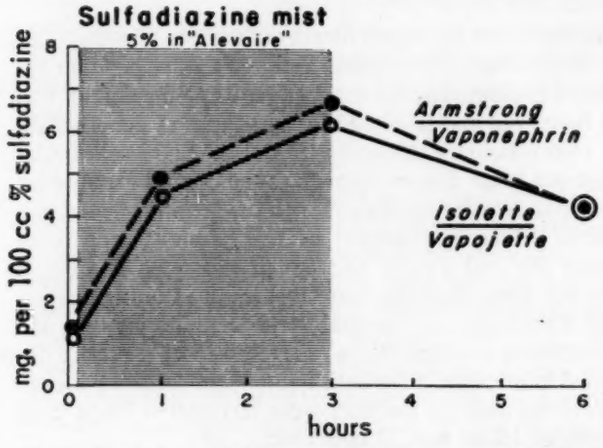

Fig. 1.—Blood levels of sulfadiazine achieved by exposure to sulfadiazine mists.

that these various incubators and nebulizers produce mists of comparable effectiveness. Infants of more than 1,250 gm. birth weight were given oral feedings before age 72 hours and, in this category, there was no significant difference in initial weight loss between the control group and the group treated with Alevaire.

TABLE 1.—*Comparability of Control Group and Group Treated with Alevaire*

	Group		Difference ÷ S. E.$_{Difference}$
	Alevaire	Control	
Total no. of infants	105	95	
Sex (male)	45.7%	49.4%	< 1.0 S. E.
Color (nonwhite)	35.2%	28.2%	< 1.5 S. E.
Birthplace (intramural *)	29.5%	32.6%	< 1.0 S. E.
Service (private)	50.4%	56.8%	< 1.0 S. E.
Birth weight, mean	1,343.8 gm.	1,316.0 gm.	< 1.0 S. E.
S. D.	(± 371.3)	(± 413.1)	
Age mother, mean	28.0 yr.	27.3 yr.	< 1.0 S. E.
S. D.	(± 6.2)	(± 6.0)	
Birth rank, mean	2.7	2.3	< 1.5 S. E.
S. D.	(± 1.7)	(± 1.5)	
Type of delivery			
Spontaneous	90.4%	90.5%	< 1.0 S. E.
Cesarean	7.6%	6.3%	< 1.0 S. E.
Induced	1.9%	3.1%	< 1.0 S. E.
Stated cause of prematurity			
Multiple pregnancy	17.1%	18.9%	< 1.0 S. E.
Toxemia	8.5%	6.3%	< 1.0 S. E.
Placenta previa	4.7%	5.2%	< 1.0 S. E.
Trauma	2.8%	2.1%	< 1.0 S. E.
Unknown cause	66.6%	67.3%	< 1.0 S. E.

* Born at Sloane Hospital for Women, obstetrical unit of Columbia-Presbyterian Medical Center.

COMPARABILITY OF GROUPS

One hundred five infants were alloted to the group treated with Alevaire, and 95 infants were designated as controls. Although any variation between the two groups could only be ascribed to random variation, it was unlikely but entirely possible through the ordinary play of chance to have gross bias, for example, with respect to sex, which would seriously interfere with comparisons. It is necessary, therefore, to describe the two groups in some detail to establish that they were reasonably equivalent except in the treatment on trial.

TABLE 2.—*Prophylactic Antibacterial Therapy in the First Seventy-Two Hours of Life*

	Group		Difference ÷ S. E.$_{Difference}$
	Alevaire	Control	
Penicillin (no. of infants)	77	67	
Age therapy started, mean.	19.2 hr.	18.5 hr.	< 1.0 S. E.
S. D.	(± 14.6)	(± 14.8)	
Total dose, mean	299,600 units	238,900 units	< 1.0 S. E.
S. D.	(± 1,120)	(± 880)	
No penicillin	26.7%	29.5%	< 1.0 S. E.
Sulfisoxazole (no. of infants).	69	60	
Age therapy started, mean.	21.1 hr.	19.9 hr.	< 1.0 S. E.
S. D.	(± 11.6)	(± 14.1)	
Total dose, mean	0.231 gm.	0.233 gm.	< 1.0 S. E.
S. D.	(± 0.206)	(± 0.141)	
No sulfisoxazole	30.4%	28.7%	< 1.0 S. E.

Of the group treated, 45.7% were male; 49.4% of the control group were male (table 1). The significance of the difference between these two percentages is evaluated in terms of the standard error of the difference. This value was less than 1. A difference of less than 2 standard errors may be expected to occur so frequently through chance variation that no significance can be confidently attached. Thus, with respect to sex, a difference of less than one standard error indicates that there was comparable representation in the two groups. Similarly, the two groups were comparable (S. E. below 1.5) with respect to color, birthplace, economic level as roughly judged by service (private versus ward), birth weight, mother's age, birth rank, type of delivery, and cause of prematurity.

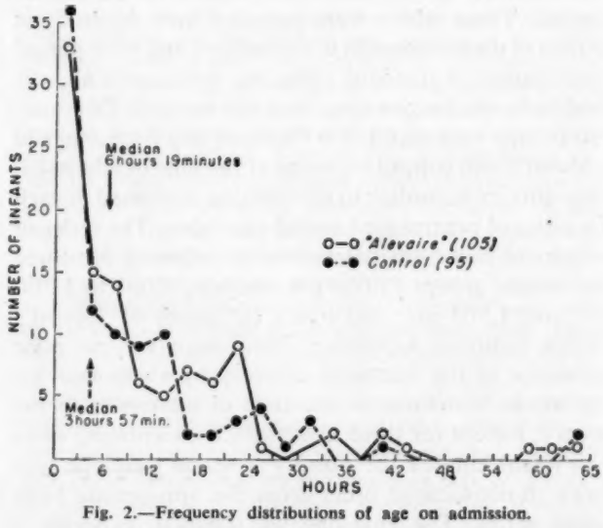

Fig. 2.—Frequency distributions of age on admission.

Prophylactic antibiotic treatment during the trial period was comparable in the two groups (table 2). The age when penicillin therapy was started, the total dose given, and the percentage of infants who received no penicillin were comparable. The same was true of sulfi-

6. O'Brien, D.; Hansen, J. D. L., and Smith, C. A.: Effect of Supersaturated Atmospheres on Insensible Water Loss in the Newborn Infant, Pediatrics **13**: 126, 1954.

soxazole (Gantrisin). The frequency distribution of the age on admission to the nursery (fig. 2) describes a similar pattern in both groups, indicating that infants in the two categories were admitted to the nursery at comparable ages. The mean age on admission to the nursery of the group treated with Alevaire was 11.6 (S. D. ± 13.0) hours, of the control group 9.9 (S. D. ± 11.9) hours

$$\text{Difference} \div \text{S.E.}_{\text{Difference}} = <1.0 \text{ S. E.}$$

The infants who died during the clinical trial (under age 72 hours) were comparable with respect to the period of time spent in either mist-treated or control incubators. The duration of exposure to risk of infants who died under age 72 hours was: with Alevaire (23 infants) 22.0 ± 16.0 hours; control (24 infants) 24.4 ± 16.4 hours

$$\text{Difference} \div \text{S.E.}_{\text{Difference}} = <1.0 \text{ S. E.}$$

RESULTS

Although an attempt was made to evaluate the clinical course of the infants in the first three days of life, this proved impracticable. It was impossible to quantify the observations so that a proper comparison could be made between the two groups. For this reason, death was adopted as the criterion of comparison. The frequency distributions of the age at death (under age 72 hours) were similar in the two groups (fig. 3). The mean age at death of the group treated with Alevaire was 34.5 (S. D. ± 15.9) hours, of the control group 31.8 (S. D. ± 17.5) hours

$$\text{Difference} \div \text{S.E.}_{\text{Difference}} = <1.0 \text{ S. E.}$$

The crude death rate (under age 72 hours) was not significantly different in the two groups. The crude death rate (under age 72 hours) was: with Alevaire 22.0%, control 25.3%

$$\text{Difference} \div \text{S.E.}_{\text{Difference}} = <1.0 \text{ S. E.}$$

Moreover, after due allowance was made for minute distribution differences with respect to age, sex, color, birth weight, gestational age, and place of birth, there was

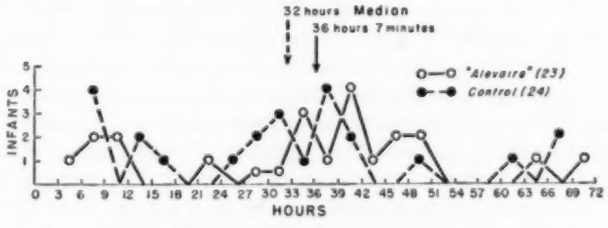

Fig. 3.—Frequency distributions of age at death under 72 hours.

again no significant difference between the two groups. Standardized death rates with the use of specific standard rates of four years' experience [7] were: with Alevaire 34.8%, control 33.0%

$$\text{Difference} \div \text{S.E.}_{\text{Difference}} = <1.0 \text{ S. E.}$$

Autopsies were performed and the lesions evaluated by one of the authors (D. H. A.), with no knowledge of the trial conditions that preceded each death. The autopsy findings among those who died before they were 72 hours old were essentially the same in the two groups (table 3). Among 19 infants coming to autopsy in the group treated, there were nine examples of hyaline-like membrane in the lung; six examples were found in the control group among 20 infants coming to autopsy. Atelectasis rates were no different, nor was there any significant difference in the incidence of intracranial hemor-

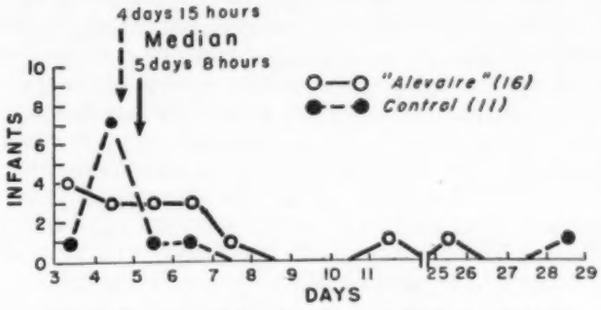

Fig. 4.—Frequency distributions of age at death over 72 hours.

rhage, major infection, or major anomalies. The distributions of age at death over 72 hours were not significantly different (fig. 4). Four deaths occurred in the group

TABLE 3.—*Autopsy Findings in Infants Who Died Under Seventy-Two Hours of Age*

	Group	
	Alevaire	Control
Died under 72 hr.	23	24
Autopsies	19	20
Pulmonary findings		
Hyaline membrane	9	6
Atelectasis	13	13
Pneumonia	7	12
Aspiration of amniotic fluid (massive)	2	4
Central nervous system findings		
Intraventricular hemorrhage	10	12
Other central nervous system hemorrhage	8	7
Major infection		
Bacteremia	3	3
Omphalitis	3	4
Other findings		
Major anomalies	1	2

treated with Alevaire during the last 24 hours of the mist treatment, and four deaths occurred in the first 24 hours after mist was stopped. Thus, since there was no

TABLE 4.—*Autopsy Findings in Infants Who Died After Termination of Trial Conditions*

	Group	
	Post-Alevaire	Post-control
Died over 72 hr.	16	11
Autopsies	15	8
Pulmonary findings		
Hyaline membrane	2	1
Atelectasis	11	6
Pneumonia	10	7
Central nervous system findings		
Intraventricular hemorrhage	6	4
Other central nervous system hemorrhage	4	4
Kernicterus	6	4
Major infection		
Omphalitis	3	5
Bacteremia	5	..
Enteritis	2	1
Meningitis	1	..
Other findings		
Major anomalies	2	2

sharp upswing in the number of deaths in the first day after Alevaire therapy was discontinued, there was no reason to suppose that mist therapy had been stopped too soon.

7. Silverman, W. A.; Fertig, J. W., and Kraus, A.: A Proposed Method of Computing Standardized Death Rates for Premature Nurseries, Pediatrics, to be published.

The autopsy findings among those who died after conclusion of the trial conditions were not significantly different in the group that had served as controls and the group that had been treated with Alevaire (table 4). Two examples of hyaline membrane occurred among 15 infants coming to autopsy after treatment; one example was noted among eight control infants coming to autopsy. Again, comparable atelectasis rates were noted. Intracranial hemorrhage and kernicterus occurred with equal frequency. The incidence of major infection was insignificantly different in the two groups. The over-all 28 day mortality rates of the two groups were not significantly different. The crude mortality rate (28 days) was: with Alevaire 37.1%, control 36.8%

$$\text{Difference} \div \text{S.E.}_{\text{Difference}} = < 1.0 \text{ S. E.}$$

SUMMARY AND CONCLUSIONS

A controlled study of the effect of Alevaire mist therapy on premature infants in the first 72 hours of life was conducted over a 10 month period with 200 subjects. There was suggestive evidence that, among infants of less than 1,251 gm. birth weight, who were not given oral feedings during the first three days of life, those who spent this period in mist-filled incubators lost less initial weight than did controls, who were in incubators under standard operating conditions (90 to 100% relative humidity). Despite this effect, there was no therapeutic benefit as judged by death rate and autopsy findings that could be credited to Alevaire mist therapy of premature infants in the first three days of life.

622 W. 168th St. (32) (Dr. Silverman).

PREVENTION AND TREATMENT OF CHRONIC GOUTY ARTHRITIS

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and
T. F. Yü, M.D., New York

The natural history of clinically overt gout is marked by explosive outbursts of acute gouty arthritis and by concomitant slow, insidious deposition of uric acid in the tissues, which in some instances progresses to disabling and deforming chronic gouty arthritis. Until recently, no clear distinction was made either in the immediate pathogenesis or in the management of these two manifestations of the gouty trait. Therapy in gout has, in fact, been almost wholly preoccupied with control of recurrent acute gouty arthritis; the most imperceptible accumulation of tophaceous deposits appears to have been accepted as inevitable and irremediable, save for what could be accomplished by surgical incision or amputation. The purpose of the present report is to describe the results obtained in the prevention and treatment of chronic gouty arthritis by a medical regimen combining uricosuric drugs and dietary regulation.

THE DICHOTOMY OF GOUT

Acute and chronic gouty arthritis both ultimately derive from a common error of purine metabolism; but, it seems probable that different immediate mechanisms, operating within the general framework of the over-all metabolic anomaly, are responsible for these two expressions of the gouty trait.[1] Chronic gouty arthritis clearly is the direct result of deposition of uric acid in the tissues, whereas, despite the general assumption, the episodic fulminating local and systemic manifestations of acute gouty arthritis probably are not due to uric acid per se, a pharmacologically inert substance. Certainly from the therapeutic point of view a distinction between acute and chronic gouty arthritis must be made. For example, colchicine, the sovereign remedy for acute gouty arthritis, has no detectable effect on uric acid metabolism and, when given alone in regular, prophylactic doses, does not prevent the progressive development of chronic gouty arthritis even if the incidence of acute seizures is successfully curtailed. On the other hand, probenecid (Benemid) effectively increases urinary uric acid excretion and lowers serum uric acid levels but is of no benefit in the treatment of acute gouty arthritis. It is therefore necessary, in treating gouty subjects who have recurrent gouty arthritis and also give evidence of significant tophaceous deposit, to make separate therapeutic provision for each of these two processes. The management of acute gouty arthritis is almost wholly empirical. Colchicine, phenylbutazone, or corticotropin are effective, singly or in combination, in terminating attacks, but their mode of action is obscure, and the causative agent of the acute attack remains unknown. A regimen of small, daily, prophylactic (suppressive) doses of colchicine, together with such dietary regulation as may be indicated in the individual case, is instituted to reduce the incidence and severity of the acute seizures. The details of prevention and treatment of acute gouty arthritis have been given elsewhere [2] and will not be considered further here. In the prevention and treatment of chronic gouty arthritis a wholly different orientation is required. This will be apparent from a consideration of pathogenesis.

PATHOGENESIS

What is rather loosely termed chronic gouty arthritis is the composite result of the deposition of uric acid in and around synovial membranes, articular cartilages, bone, periarticular tissues, bursae, ligaments, tendons, and overlying subcutaneous tissue, together with the slowly destructive effects and chronic inflammatory and granu-

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Read, in part, before the Section on Experimental Medicine and Therapeutics at the 103rd Annual Meeting of the American Medical Association, San Francisco, June 23, 1954.

This study was supported by grants-in-aid from the National Institute of Arthritis and Metabolic Diseases, National Institutes of Health, and from the New York chapter, Arthritis and Rheumatism Foundation.

1. Gutman, A. B., and Yü, T. F.: Gout, a Derangement of Purine Metabolism, Advances Int. Med. **5**: 227-302, 1952.

2. Gutman, A. B., and Yü, T. F.: Current Principles of Management in Gout, Am. J. Med. **13**: 744-759 (Dec.) 1952.

lomatous reactions secondary to these collections of uric acid, which acts as an inert foreign body. Such tophaceous deposits are apt to appear, sooner or later, in joints or bursae that are the site of successive acute seizures. In fact, it is often difficult in tophaceous gout to distinguish between minor acute attacks and exacerbations of chronic secondary inflammatory reaction. Nevertheless, chronic gouty arthritis cannot be regarded simply as protracted acute gouty arthritis or as the cumulative result of repetitive acute attacks, since, in many cases, tophi form without preliminary acute manifestations in the area of involvement. Moreover, while certain joints and bursae are sites of predilection, uric acid frequently is deposited in nonarticular cartilage (ear) and may accumulate in viscera, notably the kidneys. Chronic gouty arthritis is therefore but one aspect of a more general, if still selective, trend toward increment of tissue uric acid with passage of time.

Tophaceous deposits may be regarded as the result of intermittent or sustained periods of positive uric acid balance in gouty subjects. Uric acid being an end-product of purine metabolism in man, and not readily degraded except by the bacterial flora of the intestinal tract, positive uric acid balance leads to accumulation in the circulatory fluids and precipitation in predisposed tissues. This process is facilitated by the sparing solubility of uric acid and its naturally occurring salts. In gouty bursal effusions, for example, reabsorption of the fluids is apt to leave behind a residue of uric acid crystals. Whether or not the uric acid balance becomes positive depends, in the final analysis, upon the adequacy of the rate of uric acid excretion, chiefly by way of the kidneys, in relation to the rate of uric acid production. The uric acid load delivered to the kidneys may be greatly increased without retention; so long as this is accomplished chronic gouty arthritis presumably will not develop. On the other hand, renal mechanisms for excretion of uric acid may not be able to cope with large loads, particularly if sustained, or indeed with normal loads; the stage is then set for the development of significant tophaceous deposits.

Excessive production of uric acid, facilitating the development of positive uric acid balance, may occur in gout, and by at least three different metabolic routes. Isotopic studies [3] indicate that in an estimated 25% or more of gouty subjects uric acid is regularly synthesized from simple carbon and nitrogen precursors at a rate of the order of threefold normal, by shunt pathways not involving intermediate incorporation into nucleic acids. An abundance of purines in the diet also leads to excessive uric acid production, by degradation of the preformed nucleic acids or purines ingested. Finally, in gout secondary to various hemopoietic disorders the turnover of nucleic acids involved in hemopoiesis is accelerated, with excessive formation of uric acid.[4] Each of these metabolic pathways has implications in respect to dietary regulation in management.

In respect to the adequacy of renal excretion of uric acid, the development of positive uric acid balance in gout may, in a sense, be due in part to a perversity of renal function. Although uric acid would seem to be a useless end-product of metabolism in man, the kidney of normal man conserves it sedulously by efficient tubular reabsorption, perhaps as a persistent vestige of such a process in lower mammals that convert uric acid to allantoin. This reabsorptive activity, paradoxically, is generally preserved in gout; it may, in fact, be relatively increased. Such persistent tubular reabsorption of filtered uric acid would seem to favor tophaceous deposit, particularly when the degenerative vascular changes of advancing years impair the efficiency of glomerular filtration, sometimes further compromised by uric acid deposits in the kidneys. The use of uricosuric drugs is intended as a counteracting measure.

PRINCIPLES OF MANAGEMENT

The rate of accumulation of uric acid in gout is always slow but varies from patient to patient and apparently in the same patient at different stages of the disease, tending to accelerate in later years. In many instances no indication of tophaceous deposit ever appears throughout the lifetime of the gouty subject, hence preventive measures are never necessary. Therapy is indicated whenever there is visual or roentgenographic evidence of tophi or persistent gouty joint swelling or stiffness, which applies to roughly half of the gouty subjects encountered.[5] Figure 1 illustrates the result of neglect when there is relatively rapid progression of chronic gouty arthritis.

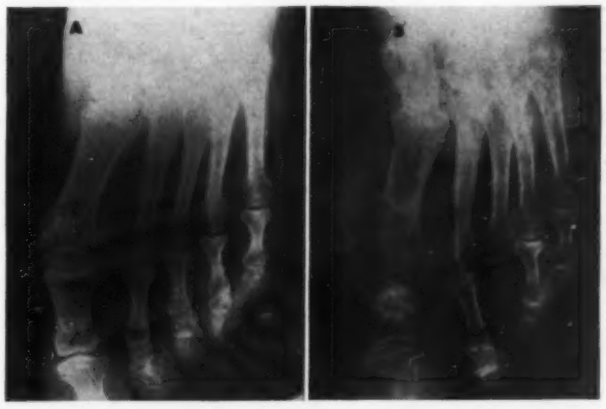

Fig. 1.—Roentgenograms of left foot in patient who had not been treated. *A*, early changes of chronic gouty arthritis in first metatarsophalangeal joint. *B*, extensive destruction of joint 12 years later.

If the essential factor in pathogenesis of chronic gouty arthritis is positive uric acid balance, the essential aim of management should be to induce a state of negative uric acid balance and to maintain this as long as may be required. To accomplish this we endeavor to decrease the rate of uric acid production, insofar as this is possible, by dietary regulation; and at the same time, and more effectively, to increase the rate of urinary uric acid excretion by regular and protracted use of a suitable uricosuric agent.

3. Benedict, J. D., and others: A Further Study of the Utilization of Dietary Glycine Nitrogen for Uric Acid Synthesis in Gout, J. Clin. Invest. **32**: 775-777 (Aug.) 1953. Spilman, E. L.: Uric Acid Synthesis in the Non-Gouty and Gouty Human, Fed. Proc. **13**: 302 (March, pt. 1) 1954.

4. Yü, T. F., and others: A Simultaneous Study of Glycine-N^{15} Incorporation into Uric Acid and Heme, and of Fe^{59} Utilization, in a Case of Gout Associated with Polycythemia Secondary to Congenital Heart Disease, Am. J. Med. **15**: 845-856 (Dec.) 1953. Laster, L., and Muller, A. F.: Uric Acid Production in a Case of Myeloid Metaplasia Associated with Gouty Arthritis, Studied with N^{15}-Labeled Glycine, ibid. **15**: 857-861 (Dec.) 1953.

5. McCracken, J. P.; Owen, P. S., and Pratt, J. H.: Gout: Still a Forgotten Disease, J. A. M. A. **131**: 367-372 (June 1) 1946.

The results unfortunately cannot be measured directly in terms of uric acid balance, since the intake is not precisely determinable (the uric acid equivalents of dietary components are too imperfectly known) and estimates of excretion are limited to urine (fecal excretion cannot be measured because of the degradation of uric acid by the bacterial flora of the intestine). Nevertheless, the degree of reduction in uric acid production effected by dietary restriction alone can be roughly gauged by the resulting fall in urinary uric acid excretion, which is usually accompanied by more or less of a decline in serum uric acid levels. The effectiveness of uricosuric agents is measured by first stabilizing the urinary uric acid excretion by a constant low purine, low fat, fixed protein diet and then determining the increment in urinary uric acid output, with its accompanying fall in serum uric acid level. Combining dietary restriction and uricosuric drugs usually causes an increase in urinary uric acid excretion and a sharp reduction in the serum uric acid level. This presumably helps to minimize or reverse the equilibrium favoring the flow of uric acid from the circulating fluids to the tissues. The extent of this reversal of flow can be measured by estimations of the cumulative excess uric acid excreted in the urine, "the total mobilizable uric acid," which amounted to approximately 100 gm. in a year in one patient with advanced tophaceous gout [6]; or, using uric acid labeled with N^{15} as a tracer, by the reduction in the miscible pool.[7] Eventually, prolonged negative uric acid balance becomes clinically evident in the failure of new tophi to appear; in diminished swelling and stiffness of joints affected by chronic gouty arthritis, particularly the feet, hands, and knees; and in unequivocal reduction in size of established tophaceous deposits as evident by inspection and in roentgenograms.

Dietary Regulation.—The effectiveness of dietary restriction is necessarily limited by the circumstance that uric acid is derived not only from preformed dietary purines but also through biosynthesis from simple nitrogen and carbon precursors formed in the catabolism of protein, fat, and carbohydrate. Uric acid production continues on any dietary and, indeed, in the fasting state. Nevertheless, the quantity of uric acid formed may be increased 100% by a high purine intake and also, but to a lesser degree, by large amounts of ingested animal (muscle) protein. A high fat diet causes uric acid retention by diminishing renal excretion of uric acid. Carbohydrate has comparatively little effect on uric acid production. Consequently, the purine and fat content of the diet should be low and the protein intake not excessive.

6. Yü, T. F., and Gutman, A. B.: Mobilization of Gouty Tophi by Protracted Use of Uricosuric Agents, Am. J. Med. **11**: 765-769 (Dec.) 1951.

7. Benedict, J. D., and others: The Effect of Salicylates and Adrenocorticotropic Hormone upon the Miscible Pool of Uric Acid in Gout, J. Clin. Invest. **29**: 1104-1111 (Aug.) 1950.

8. Gutman, A. B., in Combined Staff Clinic: Uric Acid Metabolism and Gout, Am. J. Med. **9**: 799-817 (Dec.) 1950. Gutman, A. B. and Yü, T. F.: Benemid (p-[di-n-Propylsulfamyl]-Benzoic Acid) as Uricosuric Agent in Chronic Gouty Arthritis, Tr. A. Am. Physicians **64**: 279-288, 1951. Talbott, J. H.; Bishop, C.; Norcross, B. M., and Lockie, L. M.: The Clinical and Metabolic Effects of Benemid in Patients with Gout, Tr. A. Am. Physicians **64**: 372-377, 1951. Pascale, L. R.; Dubin, A., and Hoffman, W. S.: Therapeutic Value of Probenecid (Benemid) in Gout, J. A. M. A. **149**: 1188-1194 (July 26) 1952. Talbott, J. H.: Gout and Gouty Arthritis, New York, Grune and Stratton, Inc., 1953. Gutman, A. B.; Yü, T. F., and Randolph, V.: Further Observations on the Uricosuric Effects of Probenecid (Benemid) in Tophaceous Gout, Tr. A. Am. Physicians **67**: 250-260, 1954.

We customarily begin dietary regulation in patients with chronic gouty arthritis by determining the serum uric acid level and urinary uric acid excretion per 24 hours while the patient is on his ordinary diet. Then a basal diet is instituted, which is low in purines, poor in fat, and contains 60-70 gm. of protein daily derived exclusively from cereals, grain products, eggs, cheese, milk, nonleguminous vegetables, and fruits; total calories approximate 2,000 per day. After 10 to 14 days the serum and urinary uric acid levels are redetermined. The urinary uric acid excretion is usually reduced 200-300 mg. per 24 hours. Similar studies are made after adding 4 oz. (60 gm.) of meat, fish, or fowl to the daily basal diet. From these results, and also the effects of concomitant probenecid administration, the permissible quota of meat, fish, or fowl is estimated for the individual patient. In most instances, 2-4 oz. (60-120 gm.) are allowed several days each week, in some patients once daily.

Table 1 shows the distribution of serum uric acid levels in 114 gouty subjects before and while on the basal diet. In 96 cases the serum uric acid level fell solely as a result of dietary restriction; in 22 of these the reduction was as much as 2-4 mg. per 100 cc. The mean decline, however, was only 1.1 mg. per 100 cc. As anticipated from what is now known about biosynthesis of uric acid in the body, the deterrent effect of restrictive diets on uric acid production in gouty subjects was thus found to be of modest proportions. In some instances, however, it is an important factor in management and, indeed, essential even with the maximum uricosuric effect obtainable with probenecid. In any event, dietary restriction avoids taxing the excretory capacity of the kidneys, even if adequate, by imposing upon them unnecessarily heavy uric acid loads resulting from dietary excesses.

TABLE 1.—*Effect of Diet Low in Purine and Fat and Restricted in Protein (60-70 Gm. per Day) on Serum Uric Acid Levels in 114 Gouty Subjects*

Serum Uric Acid Level, Mg. per 100 Cc.	Before Diet		On Diet	
	No.	%	No.	%
> 14.0	1	0.9	..	....
12.6-14.0	5	4.4	1	0.9
11.0-12.5	13	11.4	5	4.4
10.1-11.0	21	18.4	16	14.0
9.1-10.0	**32** *	**28.1**	20	17.6
8.1- 9.0	30	26.3	24	21.1
6.6- 8.0	12	10.5	**36**	**31.6**
< 6.6	..	....	12	10.5

* Figures in bold face represent peak incidence.

Uricosuric Agents.—To be of practical value in the prevention and treatment of chronic gouty arthritis, a uricosuric agent must be sufficiently potent to enhance uric acid excretion markedly in feasible dosage; sufficiently selective in its effects on tubular reabsorption of uric acid to avoid undue loss of essential metabolites; and of such low order of toxicity that it can be administered safely every day continuously for months or years. It is futile to give such agents discontinuously, because their uricosuric action disappears shortly after cessation of dosage and is usually followed by a compensatory period of uric acid retention. Of the drugs now available, probenecid appears best to meet these requirements.[8] A single orally administered 2 gm. dose rapidly increases

uric acid clearance to a mean approximately fourfold peak, a uricosuric effect persisting for some 24 hours.[9] This is associated in most cases with a rapid and sharp decline in serum uric acid to a mean almost half the premedication level and often within normal limits. Suppression of renal tubular reabsorption of uric acid is highly selective; except for some sodium, chloride, and water diuresis in about half the cases there is no significant effect on the excretion of electrolytes or other metabolites.[9] Side-reactions have been noted in 41 of 120 gouty subjects given probenecid daily for varying periods. These include gastrointestinal complaints (19 instances), renal colic or passage of uric acid gravel (15), precipitation of acute gouty arthritis (13), and drug allergy (6). Eleven patients exhibited more than one type of reaction. The side-effects of the drug have appeared usually with higher dosage and have, for the most part, been transitory and controllable. However, discontinuance was necessary in 14 instances because of severe heartburn (5 cases), allergic skin rash (4 cases), or renal colic (5 cases). Bone marrow damage or hepatotoxicity has not been encountered over a four year period of observation.

We customarily begin probenecid administration with 1 gm. daily dosage and determine the effects, after instituting a low purine, low fat, restricted protein diet, on urinary uric acid excretion and serum uric acid level. Depending upon the uricosuric response, the objective of uricosuric therapy (whether chiefly prophylactic or to mobilize existent large tophi), the latitude of diet, the degree of renal damage, the presence or absence of uric acid calculi, and the appearance of side-reactions, the most appropriate dosage for the individual patient is then established. In 10% of our patients this has proved to be 0.5 gm. per day, in 50% 1.0 gm. per day, in 25% 1.5-2.0 gm. per day, and in 15% 2.5-3.0 gm. per day. To avoid precipitation of uric acid in the urinary tract, large fluid intake is advised and, in some instances, alkalinizing agents are recommended.

RESULTS OF REGIMEN

Adequate data on the results of combined therapy (dietary regulation, daily administration of a uricosuric agent usually probenecid, and regular colchicine prophylaxis to minimize recurrence of acute arthritis) are available in 30 patients with significant disability due to chronic gouty arthritis who have been followed eight months to four years. In addition to the usual clinical and laboratory criteria, the progress of management has been documented in recent years by photographs and roentgenograms of tophaceous deposits before and in the course of treatment. Table 2 shows the effect of the regimen on the serum uric acid level in these 30 patients. In general, our objective in milder cases of tophaceous gout was reduction of serum uric acid levels at least to 7 mg. per 100 cc., and in more advanced cases to less than 6 mg. per 100 cc. While the response, on the whole, was gratifying, we were unable to achieve optimum reductions in serum uric acid in approximately 30% of cases due to preexistent impairment of renal function, irregularities in adhering to the prescribed dietary or drug schedule, or inadequacy of probenecid even in 3 gm. per day dosage. As judged by the prevention or mobilization of tophi, however, the level of serum uric acid critical for establishment of negative uric acid balance would appear to exceed somewhat the upper limits of normal in most cases.

Twenty-three of these patients were significantly handicapped by deformities due to tophaceous deposits. In six cases improvement due to reduction in the size of tophi was very substantial, in five it was definite, in nine it was distinct but slight, and in three no obvious change has yet occurred. Roentgenograms showed corresponding reductions in soft tissue swelling, however, with little or no evidence of repair of associated bone lesions. Disability due to joint stiffness, present in 18 cases, disappeared in 8, was definitely diminished in 9, and did not improve in one case. Eighteen patients had persistent joint pain attributable to chronic gouty arthritis; in all but one instance the pain slowly disappeared completely (15 cases) or was markedly reduced (2 cases). In 21 cases, there was, in addition, frequent incapacitation due to recurrence of acute gouty arthritis. In every instance these attacks have been reduced in severity and frequency, in most cases to virtual freedom from distress on this account. The depletion of tissue uric acid may contribute to this result, but the principal factor appears to be colchicine prophylaxis, since, when this was inadvertently interrupted by five patients, acute gouty arthritis invariably recurred.

TABLE 2.—*Effect of Combined Dietary and Uricosuric Drug Regimen on Serum Uric Acid Levels in Thirty Patients with Chronic Gouty Arthritis Followed Eight Months to Four Years*

Serum Uric Acid Level, Mg. per 100 Cc.	Before Therapy		On Therapy	
	No.	%	No.	%
12.6-14.0	1	3.3	..	....
11.1-12.5	6	20.0	..	....
10.1-11.0	8	26.7	..	....
9.1-10.0	6	20.0	..	....
8.1- 9.0	9	30.0	..	....
7.1- 8.0	..	....	3	10.0
6.1- 7.0	..	....	15	50.0
< 5.1- 6.0	..	....	12	40.0

We did not resort to surgical drainage or amputation in any case. Of three persistently discharging sinuses encountered, two healed completely within six months. The indications for surgical intervention in chronic gouty arthritis would appear to be reduced to removal of easily accessible and discretely circumscribed deposits, particularly involving the olecranon bursae. Subsequent continued administration of probenecid will prevent recurrence. Amputation of even severely involved digits is now rarely if ever necessary. In no instance, once the regimen was fully established, have new tophi appeared or old tophaceous deposits demonstrably increased in size; that this result is attributable to therapy is indicated by the fact that premature (usually unauthorized) cessation of uricosuric therapy was followed eventually by recurrence of visible tophi in five instances. It would therefore appear that the disabilities and deformities of chronic gouty arthritis are preventable.

9. Sirota, J. H.; Yü, T. F., and Gutman, A. B.: Effect of Benemid (p-[di-n-Propylsulfamyl]-Benzoic Acid) on Urate Clearance and Other Discrete Renal Functions in Gouty Subjects, J. Clin. Invest. **31**: 692-701 (July) 1952.

REPORT OF CASES

CASE 1.—A male, aged 66, had the first of many attacks of acute gouty arthritis affecting the great toes in 1932. Since 1938 the ankles, knees, elbows, and hands had been successively involved by acute seizures, with frequent recurrences. Tophaceous deposits were first noted in the ears (1933), then in both feet (1939), the fourth finger of the left hand (1945), and left olecranon bursa (1945), all becoming progressively larger. Since 1943 he had not held his job as salesman because of the frequency of acute attacks and the development of so much persistent deformity, pain, and stiffness of the ankles and knees as to make walking and standing increasingly difficult.

When first examined by us in June, 1950, he had visible and roentgenographic evidence of chronic gouty arthritis, most marked in both feet. The serum uric acid level consistently exceeded 11 mg. per 100 cc.; the mean urinary uric acid excretion approximated 500 mg. per 24 hours. He was given prophylactic doses of colchicine, 1 mg. every day; a low purine, low fat, and 70 gm. per day protein diet; and, in July, 1950, he was started on a regimen of 2 gm. probenecid daily. The mean daily urinary uric acid excretion rose to 644 mg. per 24 hours, and the serum uric acid level fell to 6.5-8.0 mg. per 100 cc., where it was maintained. However, because of persistent diffuse pain and stiffness of various joints, it was decided in October, 1950, to institute salicylate therapy with concomitant sodium bicarbonate, 5 gm. daily. He was given 4 gm. daily of enteric-coated sodium salicylate, which caused less gastrointestinal distress and other signs of salicylism than uncoated preparations. In December, 1950, the salicylate dosage was increased to 5.2 gm. per day, which he took without interruption until February, 1952. The urinary uric acid excretion on this regimen rose to 700 to 1,000 mg. per day, and the serum uric acid level was consistently maintained at 3.3-5.5 mg. per 100 cc. Diffuse joint pain and stiffness improved so that he could gradually resume full activity. In February, 1951, he noted a decrease in the tophaceous deposits of the feet and could use smaller shoes. The deposits in his left hand also began to shrink. The progressive diminution of tophi is shown in figures 2 and 3. Subsequently, the tophi of his ears and olecranon bursa also vanished. No new tophi appeared. Roentgenograms show marked reduction in soft tissue deposits but only equivocal evidence of sclerosis of affected bone. Administration of daily prophylactic doses of colchicine was continued, and, from June, 1950, until the present time he has suffered at most one or two mild attacks of acute gouty arthritis a year.

Fig. 2.—*A*, left foot of patient in case 1, December, 1950; *B*, September, 1951; *C*, January, 1953.

In December, 1951, he began to show signs of irritability and mental deterioration, with increasing memory defects, confusion, and paranoid delusions. Despite the inconspicuousness of the usual indications of salicylism, it was suspected that his mental symptoms might be manifestations of insidious salicylate poisoning or alkalosis, and, in February, 1952, salicylate-bicarbonate medication was discontinued. Within a week or two there was striking improvement of his mental state, but by mid-March he again complained of some stiffness in the knees. Accordingly, a modified uricosuric regimen of 1 gm. of probenecid per day for three days, one free day, then enteric-coated sodium salicylate, 3 gm. per day for three days, was instituted and continued without interruption to the end of September, 1952. Throughout this period the serum uric acid level was maintained at 6-7 mg. per 100 cc. By this time the patient was so improved that he voluntarily discontinued all medication except prophylactic doses of colchicine. Some pain and stiffness of the knees recurred, whereupon the patient resumed salicylate therapy, 3 gm. per day, plus bicarbonate, 5 gm. per day. Within a month all his mental symptoms returned, so uricosuric medication was discontinued, again with prompt improvement in his mental state.

Fig. 3.—*A*, left hand of patient in case 1, December, 1950; *B*, September, 1951; *C*, January, 1953.

Since February, 1953, the patient has been taking only regular prophylactic doses of colchicine, 1 mg. per day, together with infrequent small doses of phenylbutazone to control occasional joint stiffness or pain. He is virtually asymptomatic, has continued full activities, and, although his uric acid level has ranged between 10.6 and 12.2 mg. per 100 cc. since discontinuance of uricosuric therapy, there has been no visible recurrence of tophi as yet (June, 1954). An account of this case to September, 1951, was recorded elsewhere,[6] apparently the first recorded example of successful mobilization of gouty tophi. Marson[10] has since reported additional results with salicylates.

Fig. 4.—*A*, left foot of patient in case 2, October, 1951; *B*, May, 1952; *C*, January, 1954.

CASE 2.—A male, aged 82, suffered his first attack of acute gouty arthritis in 1922 and from 1924 to 1946 averaged six to eight severe seizures each year, involving feet, hands, knees, and elbows. Since 1946 there has been a spontaneous decline in the frequency and severity of acute attacks, which in recent years have averaged three or four rather mild seizures a year, readily responding to small doses of colchicine. The patient considers the present discomforts of his recurrent acute gouty arthritis too inconsequential to warrant regular colchicine pro-

10. Marson, F. G. W.: Studies in Gout, with Particular Reference to the Value of Sodium Salicylate in Treatment, Quart. J. Med. **22**: 331-346 (July) 1953.

phylaxis. The development of tophi was so insidious that their onset cannot be dated. Tophi were first noted in the ears. By 1939 the base of the great toes and the ankles, heels, and elbows were grossly enlarged and deformed, and by 1946 both hands were markedly involved. There was progressive disability and deformity due to chronic gouty arthritis, with steady increase in the size and number of tophaceous deposits.

When first examined by us in June, 1951, the patient presented the classical picture of advanced tophaceous gout. The gait was labored despite use of oversize canvas shoes, and there was limitation of motion and function of the hands. The serum uric acid level was 8.1 mg. per 100 cc. Probenecid therapy, 1 gm. per day, was started in September, 1951, together with a low purine, low fat diet; intake of meat, fish, or fowl was reduced to medium portions every day, but further restriction was not accepted. On this regimen the serum uric acid level fell to 6.0-6.5 mg. per 100 cc. In October, 1951, the dosage of probenecid was increased to 1.5 gm. per day, and the serum uric acid level was thus maintained at 5 mg. per 100 cc. He has continued on this regimen to date, an increase in probenecid dosage to 2 gm. per day failing further to lower the serum uric acid levels. In May, 1952, the patient noted a decrease in the tophaceous deposits of the feet, later also of the hands and of the left olecranon bursa. The progressive improvement in the feet and hands is shown in figures 4 and 5. These changes were associated with slow but steady improvement in gait and eventual

Fig. 5.—*A*, right hand of patient in case 2, October, 1951; *B*, January, 1954.

return to normal shoe size, less stiffness and greater mobility of affected joints, and almost complete recovery of the use of his hands. There is roentgenographic evidence of disappearance of soft tissue swelling and distinct though slight recalcification of affected bones. No new tophi have appeared.

CASE 3.—A male, aged 66, had his first attack of acute gouty arthritis in 1936 and since then has suffered two or three severe attacks and five or six mild attacks each year. In recent years the acute seizures have been less violent but last longer and involve multiple joints of the feet and hands. The first tophus appeared in the left olecranon bursa about 1941. It was removed surgically, only to recur. Since then tophaceous deposits have appeared in both ears, the right elbow, the right hand, and at the base of both great toes. He was obliged to leave his job as a furrier because of disability due to the tophaceous deformity of his right hand and pain and stiffness of his fingers. When first examined by us in August, 1952, he had chronic gouty bursitis of both elbows and chronic gouty arthritis of the right hand and both feet. Numerous tophi were present in both ears. The serum uric acid level with the patient on his regular diet was 9.7 mg. per 100 cc. and fell to 7.8 mg. per 100 cc. on the basal diet, with a urinary uric acid excretion of 360 mg. per 24 hours. The urine contained a trace of albumin with occasional casts; the serum nonprotein nitrogen level was 41 mg. per 100 cc.

In September, 1952, the patient was started on a regimen of restricted diet, prophylactic doses of colchicine, 1.5 mg. per day (later reduced to 1.0 mg. per day), and probenecid, 1.0 gm. per day. The urinary uric acid excretion rose to 600 mg. per 24 hours, but as the serum uric acid level did not fall below 7.0 mg. per 100 cc. the probenecid dosage was increased in October, 1952, to 2.0 gm. per day. On this dosage the serum uric acid level varied from 5.4 to 7.3 mg. per 100 cc., with the urinary uric acid excretion unchanged. In February, 1953, the probenecid dosage was further increased to 3.0 gm. per day. This brought the serum uric acid level down to about 5.0 mg. per 100 cc. where it has been maintained. The patient has had no severe acute gouty arthritis and negligible minor attacks since September, 1952, when regular colchicine prophylaxis was instituted.

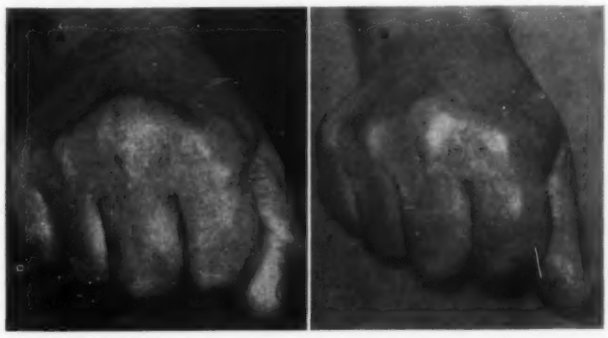

Fig. 6.—*A*, right hand of patient in case 3, September, 1952; *B*, April, 1954.

About a year after probenecid administration was started he noted a decrease in the number of tophi in the ears and progressive diminution in the size of the tophaceous deposits in his right hand (fig. 6). The feet show no change that can be seen as yet. No new tophi have appeared. The dosage of probenecid has been reduced to 2.0 gm. per day, the serum uric acid level remaining at 5.4 mg. per 100 cc. He has been able to resume, without interruption, his occupation as furrier.

CASE 4.—A male, aged 57, had his first attack of acute gouty arthritis in 1922. The attacks averaged five a year in the ensuing eight years, then became more numerous, and from 1941 on were so frequent as to keep him incapacitated much of the time. The first tophaceous deposit noted involved the left olecranon bursa in 1935. This was removed surgically and did not recur. Tophi appeared in the ears in 1940, and since then there has been progressive enlargement and deformity of the left hand,

Fig. 7.—*A*, left hand of patient in case 4, July, 1952; *B*, March, 1953.

both feet, and the left ankle. He was able to carry on his work as a jeweler only intermittently and with difficulty due to involvement of the hand. Attempted surgical removal of tophaceous deposits in the left hand, in April 1952, was unsuccessful. When first examined by us in July, 1952, he presented the typical picture of chronic gouty arthritis and was in the midst of an acute attack involving the right hand. This was controlled with colchicine. The serum uric acid level was 11 mg. per 100

cc. while the patient was on a restricted diet; the basal urinary uric acid excretion was 640 mg. per 24 hours. In August, 1952, he was started on a regimen of dietary restriction; probenecid, 1.5 gm. per day; and prophylactic doses of colchicine, 1.5 mg. per day. He suffered three additional acute attacks in 1952 and five mild seizures in 1953. In the first six months of 1954 he had only one acute attack, when he inadvertently omitted taking colchicine for a few days.

The effect of the initial probenecid dosage was to increase the urinary uric acid excretion to 750 mg. per 24 hours, with lowering of the serum uric acid level to 6.5 to 7.7 mg. per 100 cc. Progressive increase in dosage to 3 gm. per day, in December, 1952, raised the urinary uric acid excretion to 800 mg. per 24 hours and brought the serum uric acid level down to 5 mg. per 100 cc., where it has been maintained. In March, 1953, the tophaceous deposits of the left hand were distinctly reduced (fig. 7), and toward the end of that year disappearance of the tophi of the ear and diminution of the swelling of the left ankle were noted. Thus far there has been no definite change in the feet. The patient has been at work without interruption for the past year.

CASE 5.—A male, aged 39, had his first attack of acute gouty arthritis in 1937. From 1937 to 1943 he had three to six incapacitating attacks each year, in addition to many mild episodes. In 1943 he began to take prophylactic doses of colchicine irregularly, about 0.5 mg. several days each week. This was continued until 1952, during which period he had fewer severe attacks but about the same frequency of mild attacks. In 1940 a tophus was noted in his ear and later another at the base of the left great toe. By 1948 the tophaceous deposits at the base of the left great toe had so enlarged that surgical evacuation was performed. This was followed by recurrence after a year and development of similar deposits in the right foot. When first examined by us in January, 1952, he had chronic gouty arthritis of both feet, the enlargement at the base of the left great toe being at least as large as before surgery. The serum uric acid level was 10.2 mg. per 100 cc., which on the basal diet fell only to 9.4 mg. per 100 cc. The uric acid excretion was 545 mg. per 24 hours. In February, 1952, he was started on a regimen of dietary restriction, prophylactic doses of colchicine, 1 mg. per day, and probenecid, 1 gm. per day. He had two severe and six mild attacks of acute gouty arthritis in 1952, three mild episodes early in 1953, and none at all for the past year. His serum uric acid level was first maintained at 6-7 mg. per 100 cc., fell to 5-6 mg. per 100 cc. when the dosage of probenecid was increased to 1.5 gm. per day in September, 1952, and then to 4-5 mg. per 100 cc. when the dosage was further increased to 2 gm. per day in February, 1953. His urinary excretion of uric acid was 700-750 mg. per 24 hours with the latter dosage. In February, 1953, he noted diminution in size of the tophaceous deposits in his feet. This reduction has continued. No new tophi have appeared.

SUMMARY AND CONCLUSIONS

Chronic gouty arthritis is attributable to sustained or intermittent positive uric acid balance. The major objective of management therefore is to induce a state of negative uric acid balance and to maintain this for as long as may be required. A regimen designed for this purpose includes dietary regulation, daily administration of a uricosuric agent (usually probenecid), and, to minimize recurrence of superimposed acute gouty arthritis, regular colchicine prophylaxis. In 30 patients with disability due to chronic gouty arthritis who were observed over a period of eight months to four years it was possible to alleviate pain and stiffness of joints and to decrease the size of tophaceous deposits in most instances. No new tophi developed when treatment was adequately maintained. It now appears to be possible to prevent the development of chronic gouty arthritis in predisposed subjects and to ameliorate established deformities and disabilities in most instances by medical management.

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DIAGNOSTIC AND THERAPEUTIC ERRORS IN CERTAIN DERMATOSES OF THE VULVA

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Medicine has been plagued for centuries with confusing terminology. Some misunderstanding arises from the perpetuation of numerous synonyms for fairly well-defined entities; however, there are a few diseases that per se are poorly or confusingly defined. Certain so-called precancerous dermatoses of the vulva fall in the latter category. The general practitioner, gynecologist, dermatologist, and others, such as the urologist and psychiatrist, have written on conditions of the vulva in their own journals in their own language. Even an authority common to all, Dorland's Medical Dictionary, is a victim of these "muddied waters," e. g., kraurosis vulvae is "called also leukokraurosis, leukoplakia vulvae, leucoplakic vulvitis and pruritus vulvae." The obscurity as to etiology, pathology, and nomenclature, and, consequently the lack of progress in therapy of these lesions are due, we feel, to lack of concerted and cooperative study by persons in the different specialties who have written about them. Several authors have made excellent attempts to unify the concepts of dermatoses of the vulva [1]; however, the situation is still clouded. The purpose of this paper is another appeal to clarify and standardize terminology, concepts and principles of diagnosis, and management of certain dermatoses of the vulva. Bacterial infections, venereal disease, specific granulomas, and tumors of the vulva as entities will not be discussed. We will attempt to show that certain vulvar dermatoses, considered by others precancerous, are not precancerous per se, and are, in fact, the antithesis of a neoplastic process.

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Figure 2 is used with the permission of Dr. C. W. Laymon.

1. (*a*) Montgomery, H.; Counseller, V. S., and Craig, W. M.: Kraurosis, Leucoplakia and Pruritis Vulvae: Correlation of Clinical and Pathologic Observations with Further Studies Regarding Resection of Sensory Nerves of Perineum, Arch. Dermat. & Syph. **30**: 80-100 (July) 1934. (*b*) Wallace, H. J., and Whimster, I. W.: Vulval Atrophy and Leucoplakia, Brit. J. Dermat. **63**: 241-257 (July) 1951.

ATROPHIES OF THE VULVA

What is kraurosis vulvae? Breisky [2] in 1885 described 12 cases of a sclerosing atrophy of the vulva that apparently also was complicated by leukoplakia. He labeled the condition "kraurosis." In 1928, Darier [3] reiterated the clinical features of an atrophy and sclerosis of the vulva and again cautioned that complication by leukoplakia was frequent. Some would divide this process into three stages.[4] During the acute stage the tissue is red, with pruritis, burning, and painful sensations and edema. The labia are prominent because of the edema, and the skin is thin, shiny, and often covered with excoriations. This lasts weeks or months. The second stage shows some whitening and mottled gray color of thickened, lichenified skin, with beginning atrophy of the labia. The third, or late atrophic stage, shows the classical kraurotic picture. The skin is smooth, glistening, and parchment-like and cracks and bleeds easily. The color is pearly to bluish-white, and the landmarks have mostly disappeared. The vaginal orifice is inelastic and stenotic. There is often intense itching and burning.

The cause of this process is unknown. Estrogen deficiency is the most popularly believed cause; however, there is some evidence against this being the cardinal factor. Vitamin A deficiency and chronic secondary infection have been suggested as possible contributing causes, but again there is little actual supportive proof. The histological features have been carefully described by Montgomery.[5] There is relative and absolute hyperkeratosis, flattening of the rete, edema and homogenization of the collagen of the upper cutis, separation of the elastic fibers, and generally absent follicular plugging but definite atrophy of the cutis and mild arteriosclerotic obliterative changes in the deeper blood vessels. A histological comparison of this and related diseases is shown in table 1. Diseases that must be included in the differential diagnosis of this sclerosing atrophy are lichen sclerosus et atrophicus, lichen planus, pruritus vulvae (lichenification, neurodermatitis), senile atrophy, scleroderma, and leukoplakia. A brief comparison of their clinical features is shown in table 2.

TABLE 1.—*Histological Comparison of Certain Dermatoses of the Vulva*

	Primary Sclerosing Atrophy						
	Kraurosis	Lichen Sclerosis	Circumscribed Scleroderma	Lichen Planus	Senile Atrophy	Neurodermatitis	Leukoplakia
Hyperkeratosis	+	+	+	+	−	+	++
Follicular plugging	±	++	−	−	−	−	−
Parakeratosis	−	−	−	−	−	+	+
Liquefaction degeneration of basal layer	±	+	−	+	−	−	±
Atrophy epidermis	+	+	+	−	+	−	−
Acanthosis	−	−	−	+	−	+	+
Dyskeratosis	−	−	−	−	−	−	+
Edema of cutis	+	+	+	+	−	+	−
Homogenization of collagen	+	+	+	−	−	−	−
Sclerosis of collagen	−	−	+	−	−	−	−
Destruction of elastic tissue	∓	∓	+	−	+	−	−
Infiltrate	+	+	+	++	−	+	±
Obliteration of blood vessels	±	±	+	−	+	−	−

TABLE 2.—*Clinical Comparison of Certain Dermatoses of the Vulva*

	Primary Sclerosing Atrophy						
	Kraurosis	Lichen Sclerosis	Circumscribed Scleroderma	Lichen Planus	Senile Atrophy	Neurodermatitis	Leukoplakia
Color	Gray Red-White	Gray White	Ivory	Violaceous	Normal	Normal to Grayish	Pearly White
Atrophy	+	+	+	∓	+	−	−
Thickening	−	−	+	+	−	+	++
Discrete papules	−	++	−	+	−	−	±
White patches	+	+	+	+	−	+	+
Edema, excoriations	±	±	−	+	−	++	+
Other areas of body involved	−	±	±	±	−	±	− (+)
Involving inner labia, clitoris, and perineal mucous membrane	+	+	+	±	+	±	+
Involving outer labia, majora, and perianal mucous membrane	∓	+	+	±	+	+	±
Shrinkage of labia and clitoris	+	±	±	−	±	−	−
Shrinkage of vaginal orifice	+	∓	−	−	±	−	−
Potentially preleukoplakic	+	+	−	−	−	−	..

Lichen Sclerosus et Atrophicus.—Lichen sclerosus is a fairly well defined disease when the typical, irregular, often polygonal, flat-topped, "mother of pearl" white papules are scattered over the upper trunk, forearms, neck, and axillas, as well as on the vulvar mucosa and skin. Occasionally, however, there is coalescence of the papules to form a definite plaque of whitish atrophic skin about the vulva without evidence of discrete papules.

2. Breisky, A.: cited by Wallace and Whimster.[1b]

3. Darier, J.: Precis de dermatologie, ed. 4, Paris, France, Masson & Cie, 1928, pp. 276, 465, and 994.

4. (*a*) Adair, F. L.; Davis, M. E., and Schuitema, D. M.: Atrophy of the Vulva, J. A. M. A. **114**: 296-302 (Jan. 27) 1940. (*b*) Davis, M. E.: Symposium on Gynecology and Obstetrics: The Differential Diagnosis and Treatment of Vulvar Lesions, S. Clin. North America **30**: 267-286 (Feb.) 1950.

5. Montgomery, H., and Hill, W. R.: Lichen Sclerosus et Atrophicus, Arch. Dermat. & Syph. **42**: 755-779 (Nov.) 1940. Montgomery and others.[1a]

Such an occurrence has been observed even in children [6] (fig. 1). There may be shrinkage of the labia and even atresia of the vaginal orifice [1b] (fig. 2), and true leukoplakia may supervene.[7] Under these circumstances it is apparent that lichen sclerosus may be clinically identical to most descriptions of kraurosis. Most authorities admit that the histology of lichen sclerosus is practically identical to that of kraurosis (fig. 3). It has been said that kraurosis never involves the skin adjacent to the labia majora or perianally; however, even this is denied by Davis.[4b] Histologically, lichen sclerosus is said to have marked follicular plugging and no obliterative changes in the deep blood vessels, in contrast to kraurosis. Follicular plugging is an inconstant finding in lichen sclerosus, and arteriosclerotic changes in the blood vessels may be found in even uncomplicated senile atrophy of the vulva or after excessive x-ray therapy. For these reasons we agree completely with Laymon,[8] Becker,[7b] and Savitt,[7c] that lichen sclerosus et atrophicus and the disease called kraurosis are fundamentally the same. Wallace and Whimster [1b] suggested the term primary atrophy to mean sclerosis and atrophy of the vulvar skin and mucous membrane of unknown cause. If such a general concept is accepted, then perhaps such a term as primary atrophy or primary sclerosing atrophy would be more generic and acceptable than lichen sclerosus et atrophicus, since the process is not always lichenoid. Furthermore, the term primary sclerosing atrophy would imply an entirely different connotation than "kraurosis," which in the minds of many infers premalignant disease. This sclerosing atrophy may at any time be complicated by secondary infection, which gives rise to the chronic vulvitis. Such infections and pruritus would account for the various phases of the vulvitis (kraurosis): (1) an acute, inflammatory, "red" phase, (2) a lichenified phase, and finally (3) an atrophic phase.

Fig. 1.—Lichen sclerosus et atrophicus with involvement of vulva only in a girl 5 years of age.

6. Laymon, C. W.: Lichen Sclerosus et Atrophicus in Childhood, Arch. Dermat. & Syph. **52**: 351-353 (Nov.-Dec.) 1945. Brain, R. T.: Lichen Sclerosus et Atrophicus, Brit. J. Dermat. **62**: 449-451 (Nov.) 1950.

7. (*a*) Laymon, C. W., in discussion on Ebert, M. H., and Yaffe, B.: Lichen Sclerosus et Atrophicus, A. M. A. Arch. Dermat. & Syph. **64**: 654 (Nov.) 1951. (*b*) Becker, F.: in discussion on Ebert, M. H., and Yaffe, B.: Lichen Sclerosus et Atrophicus, ibid. **64**: 655 (Nov.) 1951. (*c*) Savitt, L. E.: Lichen Sclerosus et Atrophicus Accompanied with Leucoplakia, Society Transactions, A. M. A. Arch. Dermat. & Syph. **66**: 419-420 (Sept.) 1952.

8. Laymon, C. W.: Lichen Sclerosus et Atrophicus and Related Disorders, A. M. A. Arch. Dermat. & Syph. **64**: 620-627 (Nov.) 1951. Laymon.[7a]

9. Lynch, F. W.: Pruritus Vulvae as Seen in Dermatological Practice: Chairman's Address, J. A. M. A. **150**: 14-18 (Sept. 6) 1952.

Lichen Planus.—Lichen planus is an inflammatory dermatosis of unknown cause characterized by multiple, small, flat-topped, polygonal papules that have a peculiar violaceous color and are covered with an often unbilicated horny film. The sites of predilection are the wrists, ankles, inner thighs, sacral area, and buccal mucous membrane. It may involve the vulva alone, and in the late, atrophic stages the color may be whitish. This has been confused with leukoplakia at times (fig. 4). The features of the primary lesions, the presence of these lesions elsewhere on the body, and the typical histological picture (table 1 and fig. 5) should differentiate these conditions.

Fig. 2.—Lichen sclerosus et atrophicus showing features of kraurosis, with atrophic, shrunken labia, and atresia of vaginal orifice. Note crural involvement.

Pruritus Vulvae.—Strictly speaking, pruritus vulvae literally means itching of the vulva. Lynch [9] has thoroughly discussed this problem and has described the multiple etiological factors. Such causes as primary pyogenic infections, secondary irritation from leukorrhea, diabetes or azotemia, moniliasis, dermatophytosis, parasitosis, contact dermatitis, drug eruptions, food allergies, psoriasis, and seborrheic dermatitis may be established by the history, physical examination, and appropriate tests and laboratory procedures. The term pruritus vulvae as used

Fig. 3.—Histological picture of lichen sclerosus et atrophicus showing hyperkeratosis, follicular plugging, atrophy of epidermis, and homogenization of collagen in upper cutis. Hematoxylin and eosin stain (× 100).

most commonly by the dermatologist means the essential or idiopathic pruritus that is considered a complex psychosomatic disorder. When this pruritus is accompanied by an inflammatory reaction that eventuates in lichenification, it is more accurately described as neurodermatitis. The clinical picture may be that of single or multiple lichenified plaques involving the outer labia, pubic region, inner thighs, and perianal area, as well as the inner surfaces of the labia and the clitoris. The white bogginess of an edematous and lichenified vulva has been confused with leukoplakia. Excoriation may cause marked edema, redness, and hypertrophy of the tissues. This would be the same as that described as the so-called second phase of kraurosis. The histology is summarized in table 1 and is that of a chronic, acanthotic, nonspecific dermatitis.

Senile Atrophy.—There is a physiological atrophic change in the skin of the vulva to varying degrees as it ages. This change usually starts at the climacteric or after artificial menopause due to castration. For this reason the

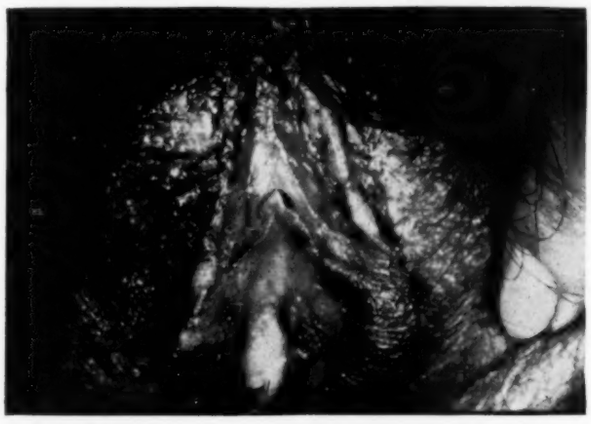

Fig. 4.—Lichen planus of vulva showing scattered, discrete, whitish lichenoid papules.

generally accepted cause is estrogen deficiency; however, the process is too complex to be explained on this factor alone. Exogenous estrogen therapy will not reverse or prevent this ultimate change. Other hormones and/or other factors contribute to the general aging phenomenon. The mons pubis becomes less prominent. The labia majora shrink and flatten out due to loss of subcutaneous fat, and the adjacent skin is thin and shiny. The hair is sparse; the normal elasticity is lost, and there is narrowing of the vaginal orifice, which may cause dyspareunia. Usually there are no symptoms from this condition; however, the skin is more susceptible to pathological changes, trauma, bruises, scratches, secondary infection, and itching. These then give rise to the condition of chronic atrophic dermatitis (vulvitis).

Circumscribed Scleroderma.—Scleroderma is a chronic dermatosis of unknown cause that is characterized by induration of the skin in localized patches or diffuse areas frequently associated with atrophy. The patches are often oval, round, or irregular; sharply defined; indurated; and lardaceous, with an ivory-whitish center and often a violaceous periphery. The histology is summarized in table 1 and is essentially an atrophy of the epidermis and a homogenization and true sclerosis of the collagen of the cutis. Clinically and histologically these patches are usually easily differentiated from leukoplakia.

Leukoplakia.—On the sclerosing atrophy diathesis, on simple senile atrophy, or on normal skin of the vulva true leukoplakia may arise. By definition it is a hypertrophic process (fig. 6). Single or multiple bluish-white, thickened plaques appear on the inner surfaces of the labia,

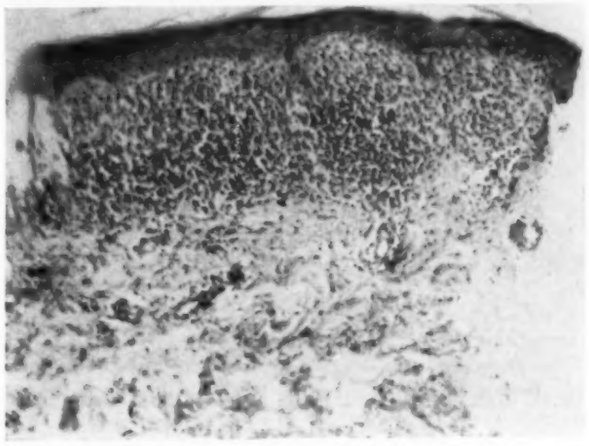

Fig. 5.—Histological features of lichen planus showing hyperkeratosis, acanthosis, liquefaction degeneration of basal layer, and zone of banal infiltrate in upper cutis. Hematoxylin and eosin stain (× 100).

about the clitoris, and on the perineum. Generally leukoplakia does not involve the outer surfaces of the labia or the anal area; however, such involvement has been reported. As the process continues, the skin becomes more thickened, with exaggerated skin cleavage lines, fissuring, and even ulceration (fig. 7). This process has been described by Montgomery [10] as a senile keratosis on the mucous membrane, and there is no essential difference

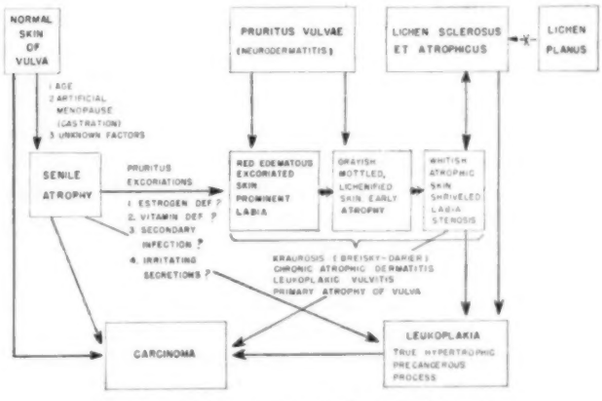
NORMAL SKIN OF VULVA
PRURITUS VULVAE (NEURODERMATITIS)
LICHEN SCLEROSUS ET ATROPHICUS
LICHEN PLANUS
1 AGE
2 ARTIFICIAL MENOPAUSE (CASTRATION)
3 UNKNOWN FACTORS
SENILE ATROPHY
PRURITUS EXCORIATIONS
1 ESTROGEN DEF ?
2 VITAMIN DEF ?
3 SECONDARY INFECTION ?
4 IRRITATING SECRETIONS ?
RED EDEMATOUS EXCORIATED SKIN PROMINENT LABIA
GRAYISH MOTTLED, LICHENIFIED SKIN EARLY ATROPHY
WHITISH ATROPHIC SKIN SHRIVELED LABIA STENOSIS
KRAUROSIS (BREISKY-DARIER) CHRONIC ATROPHIC DERMATITIS LEUKOPLAKIC VULVITIS PRIMARY ATROPHY OF VULVA
CARCINOMA
LEUKOPLAKIA TRUE HYPERTROPHIC PRECANCEROUS PROCESS

Fig. 6.—Possible pathogenesis of leukoplakia vulvae.

histologically or potentially from a senile keratoses on the face of one with a *châtaigne* skin; in other words it is precancerous. The histological features are summarized in table 1. They are essentially hyperkeratosis, acanthosis, and dyskeratosis, which may progress to carcinoma in situ (fig. 8) and eventually to frank squamous cell carcinoma. The tendency for leukoplakia to develop into

10. Ormsby, O. S., and Montgomery, H.: Diseases of the Skin, ed. 7, Philadelphia, Lea & Febiger, 1948, p. 809.

carcinoma is great, varying from 23.1% according to Miller [11] to 50% according to Taussis.[12] This is the true precancerous dermatosis of the vulva. It is well recognized that leukoplakia has a higher incidence of development on an atrophic and sclerotic vulva than on normal skin, but then, and only then, may one consider the danger of cancer ensuing.

Fig. 7.—True leukoplakia of vulva showing thickened plaque with fissuring.

TREATMENT

Proper management of any disease is contingent on accurate diagnosis. Lichen planus is treated empirically by the use of heavy metals (usually bismuth), local antipruritic medicaments, and sometimes fractional x-radiation. Circumscribed scleroderma has no specific treatment. It may involute spontaneously or remain indefinitely. Massage may expedite involution. Senile atrophy, uncomplicated, is usually asymptomatic and does not require any treatment. Dryness may be helped by bland emollients. Pruritus vulvae (neurodermatitis) in the acute, edematous phase may be treated with wet compresses. In the later, lichenified stage, antipruritic creams, pastes, or ointments are indicated. Hydrocortisone ointment may give very gratifying relief at times. Mild sedation and the antihistaminics are occasionally used. Judicious use of fractional superficial x-radiation still is very effective in selected cases. Psychotherapy with or without the aid of a psychiatrist may at times improve a superficial psychic problem; however, there is always the danger of further complicating the issue by bringing forth more serious, deep-seated emotional conflicts. The primary sclerosing atrophy should be treated as a benign condition. In the acute phase it should be treated like any other acute dermatitis, and in the subacute and chronic phases it should be treated with bland, antipruritic ointments. Ointments containing estrogens and/or vitamin A have been advocated and may be useful in the chronic stages.

Leukoplakia is the only one of these conditions that we considered precancerous. Simple destruction by electrodesiccation will suffice if the lesion is small. If it is widespread, vulvectomy is indicated, and simple vulvectomy is entirely adequate, since the active process is still in situ by definition. Frank squamous cell carcinoma as diagnosed by biopsy should, of course, be treated by radical vulvectomy.[12] A second indication for simple vulvectomy would be severe, refractory pruritus, irritation, pain, or atresia of the vulva as might occur in the course of the benign sclerosing atrophies. The procedure would remove the source of such distress and secondarily remove a preleukoplakic (not precancerous per se) condition.

COMMENT

The importance of properly diagnosing a premalignant lesion of the vulva is evident. It is no small responsibility to recommend vulvectomy, especially in a young woman. Its indication should be quite precise and its contraindication just as definite. It would be as wrong to subject a woman with a benign dermatosis, such as lichen planus, to vulvectomy as it would be to withhold such an operation from one with a true malignant lesion. We do not believe that the uncomplicated cases of primary sclerosing atrophies should be treated by vulvectomy as prophylaxis against cancer. Should the senile, so-called farmer's skin be treated surgically before the development of actual premalignant senile keratoses? Surely it appears that the premalignant leukoplakia is the reason for removal, not the preleukoplakic sclerosing atrophy or atrophic dermatitis of the vulva.

SUMMARY AND CONCLUSIONS

Much confusion exists at present in regard to terminology and concepts and principles of diagnosis and treatment of certain dermatoses of the vulva. The notable example is the so-called precancerous dermatoses. The basic condition, kraurosis, is a primary sclerosing atrophy. Lichen sclerosus et atrophicus is considered the same process. Of the group of conditions including senile atrophy, lichen planus, neurodermatitis, circumscribed scleroderma, and leukoplakia, leukoplakia is the only condition considered precancerous and should be removed. Small lesions may be destroyed by electrodesiccation; however, when the vulva is extensively involved, then vulvectomy is the treatment of choice.

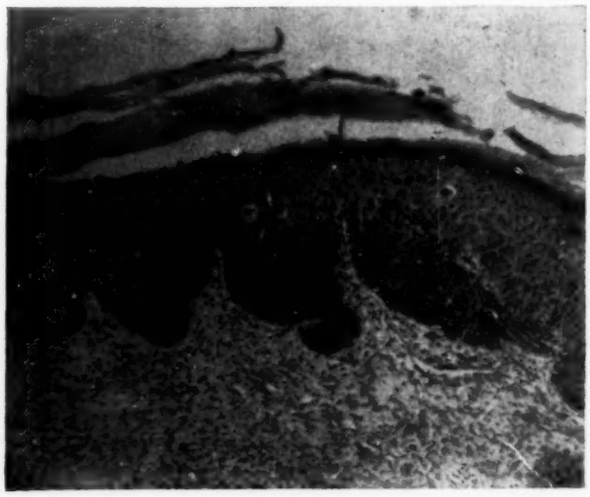

Fig. 8.—Histological picture of same case as shown in figure 7, with hyperkeratosis, acanthosis, and Bowen's-like dyskeratosis. Hematoxylin and eosin stain (× 100).

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11. Miller, N. F.; Riley, G. M., and Stanley, M.: Leucoplakia of the Vulva, Am. J. Obst. & Gynec. **64**: 768-779 (Oct.) 1952.
12. Taussig, F. J.: Cancer of the Vulva: An Analysis of 155 Cases (1911-1940), Am. J. Obst. & Gynec. **40**: 764-779 (Nov.) 1940.

CLINICAL SIGNIFICANCE OF THE TRANSITIONAL LUMBOSACRAL VERTEBRA

RELATIONSHIP TO BACK PAIN, DISK DISEASE, AND SCIATICA

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and
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It has been accepted that man's penalty for assuming an upright position is low back pain; however, it is equally evident that evolutionary processes are attempting to strengthen the unstable lumbosacral joint. In 1876, Rosenberg theorized that the vertebral column was undergoing a shortening process in an effort to stabilize the erect spine. He felt that sacralization of the fifth lumbar vertebra was anthropologically progressive, whereas lumbarization of the first sacral vertebra was regressive. Others have felt that transitional variations at the lumbosacral joint are due to strains created by a mobile fifth lumbar vertebra resting on an immobile first sacral vertebra. It is felt that the three most important steps in the evolution of the treatment of the spine for back pain are: (1) discovery of roentgen rays in in 1895, (2) discovery of spinal fusion in 1911, and (3) the demonstration of the role played by the intervertebral disk in 1934. Using these three advances as a foundation, we will attempt to evaluate the role of the transitional lumbosacral vertebra in respect to low back pain and leg pain. In recent years, physicians have put great emphasis, and quite rightfully, on the herniated disk as the primary cause of sciatic pain, forgetting to a large extent that almost the same syndrome can be caused by mechanical factors in the lower lumbar region of the spine. In relation to this, 100 patients with transitional lumbosacral vertebrae have been analyzed with respect to (1) low back pain, (2) sciatic radiation of pain, and (3) pathological changes in the disk.

During the 10 year period from 1942 to 1951, there were 920 fusions of the lumbosacral joint (excluding scoliosis and tuberculosis cases) performed at the New York Orthopaedic Hospital. Of this group, 100 patients, or 10.9%, had transitional lumbosacral vertebrae on which lumbosacral fusions were performed. Before operation, all patients with neurological signs or symptoms were seen by a neurologist or a neurosurgeon. It is our practice to have both an orthopedic surgeon and a neurosurgeon present at surgery whenever neurological signs or symptoms appear in a patient. All laminectomies or disk explorations herein reported were carried out by a neurosurgeon, after which the fusion was completed by an orthopedic surgeon.

ROENTGENOGRAPHIC STUDIES

A complete roentgenographic study of all the lumbar vertebrae and the sacrum was made in these 100 cases. Tracings were made of every roentgenogram, and these tracings were thoroughly studied before any conclusions were drawn. Correlations between the tracings and the operative findings were then made to determine the accuracy of the impression conveyed by the roentgenograms. To determine the relationship between the enlarged transverse process and the pelvis, a 45 degree anteroposterior view of the lumbosacral joint was essential. The disk space between the transitional segment and the sacrum was narrow in every case, and a narrowed disk space above was not uncommon. For practical purposes, we considered sacralization to be present when the fifth of five lumbar vertebrae was articulated through a large lateral mass to the sacrum. There was bilateral sacralization (fig. 1) in 42 patients and unilateral sacralization in 31. Unilateral sacralization was right-sided in 17 and left-sided in 14. There also was bilateral lumbarization of the first sacral vertebra in 18 of the remaining 27 patients in the series and unilateral lumbarization in 9. The unilateral lumbarization was right-sided in eight and left-sided in one.

After reviewing the roentgenograms, it was apparent that those taken preoperatively did not reveal the true status of the lumbosacral joint, especially in respect to the motion at the involved joint. Often, from the interpretation of the roentgenograms, one would expect little or no motion at the joint; however, at the time of surgery, one would find a great deal of motion possible. In analyzing the findings, we discovered that at the time of surgery 54 patients showed the amount of mobility that would be expected from the roentgenograms that were taken preoperatively, 31 patients showed increased mobility, and 15 patients showed markedly less mobility than was expected.

BACK PAIN AND UNILATERAL SACRALIZATION

All 100 patients had back pain, usually of the recurrent lumbosacral type, with radiation into one or both sacroiliac regions and frequently into the buttocks or thigh of one side. In this series, 58 patients had true sciatic radiation of pain, which in 7 was of a bilateral nature. The remaining 42 patients did not have sciatica. The average duration of back pain for this series was 6.3 years, indicating a chronic but not disabling type of pain. The average age of the patient at onset of back pain was 27.2 years.

Back pain was made worse by activity and was relieved by rest or by wearing a back support as is the ordinary lumbosacral strain type of low back pain. In all instances, an adequate, conservative, low-back treatment program was carried out before surgical intervention. In 40 patients, unilateral sacralization was shown by roentgenographic findings only, and no conclusive correlation was made with surgical findings. Five of these 40 patients

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with unilateral sacralization had only low back pain, and 10 had radiation of pain to the buttocks or thigh. There were 25 patients who had sciatic radiation of pain, but exploratory operations were not performed on 5 of these. Of the remaining 20 patients, 13 had proved disk herniation at the level above the transitional vertebra. In seven, the herniation was on the same side as the sacralization and in six it was on the opposite side. Although, as

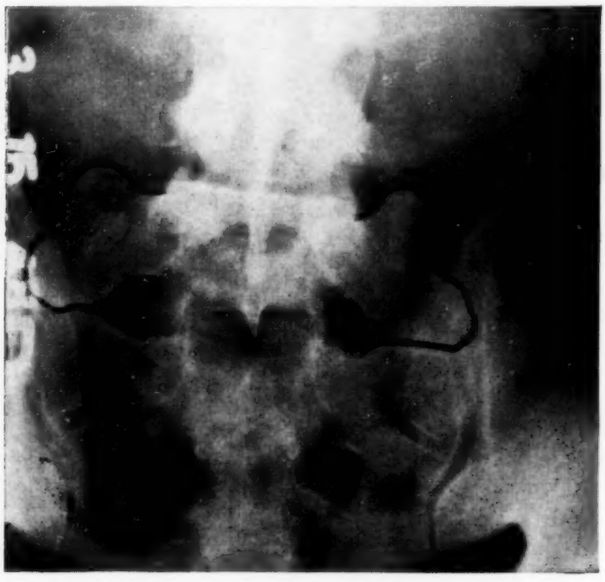

Fig. 1.—Roentgenogram showing bilateral sacralization.

judged by roentgenographic studies, unilateral sacralization appeared in 40 cases, it was actually confirmed as being stable or immobile on one side at time of surgery in only 11, giving an error in preoperative impression of 72% when compared with the operative findings. The usual sciatic radiation of pain in sacralization of the fifth lumbar vertebra occurs on the mobile side. In our series, this occurred in 90% of the patients.

Forty-six laminectomies were performed, and herniated nucleus pulposus was present in 31 of the patients at the time of surgery. All of the disk herniations were at the space above the congenital anomaly (fig. 2) except one, which was at the level of the transitional vertebra, and this one showed an extremely mobile transitional segment. In 7 of the 31 patients who had pathological changes in the disk, explorations were performed also at the level of the transitional joint, and, in all of these, the exploration gave normal findings.

ANALYSIS OF FIFTEEN PATIENTS WITH SCIATIC RADIATION OF PAIN BUT NO HERNIATED DISK AT TIME OF SURGERY

Exploration showed no disk abnormality in 15 of the 46 laminectomies performed for relief of sciatic pain. It is of interest that the surgeons felt that there must be pathological changes in the disk, because in three patients one space was explored, in nine patients two spaces were explored, and in three patients three spaces were explored. One of the most interesting findings in this study of negative explorations performed in patients in whom sciatic pain was typical was that the onset of pain low in the back was insidious and associated with sciatic radiation of pain from the very onset. This, in our experience, is in contrast to a disk herniation, in which the pain is usually localized to the back originally and sciatic radiation follows later. Also, there is frequently a history of at least minimal trauma in disk herniation, whereas in sacralization of the fifth lumbar vertebra there is back pain with no initiating traumatic episode. In this group of 15 negative explorations, 10 patients had limitation of straight leg raising on the affected side, 8 had diminished sensation over S-1 dermatome distribution, and 6 had a diminished or absent Achilles reflex. No objective neurological changes could be noted in six patients.

This group of 15 patients was followed for an average of 3.2 years after exploratory operations on the disk and spinal fusion were performed. It was found that one patient had thoracic pain, due to rheumatoid arthritis of the spine (Marie-Strümpell arthritis) (see table). One patient had pseudarthrosis and has intermittent low back pain. Another patient with pseudarthrosis that was repaired has been asymptomatic since refusion. The disk space was reexplored at the time of repair because nerve symptoms and signs were so prominent; however, no pathological changes in the disk could be found even on the second exploration. Therefore, of the 15 patients who could be considered adequately followed, 13 are completely free of back and leg pain and are asymptomatic. The two patients who have continued pain have rheumatoid arthritis of the spine and pseudarthrosis of the fusion site.

Fig. 2.—Disk herniation of L-4 and L-5 on side opposite sacralization.

In analyzing these 15 patients as to the cause of their sciatica, it was felt at time of surgery that in 3 the sciatica was due to arthritis of the joint above the transitional vertebra, which produced a localized inflammation with a resulting edema of the nerve root. In eight cases, it was felt that the segment above the transitional vertebra was unstable. In an attempt to adequately explain these neu-

rological changes on a pathological basis, we have enlisted the help of our neurosurgical colleagues. It is evident that there is no single explanation, but the following four plausible reasons have to be considered: (1) that production of a muscle spasm through instability of a joint may put pressure on the sciatic nerve; (2) that production of a venous engorgement through chronic irritation due to instability can in itself cause pressure on the nerve root; (3) that a recurring, bulging, but not herniated disk might be present that could not be found at the time of surgery; and (4) that a disk that mechanically protrudes when the body is erect and spontaneously reduces when the patient is in the prone position might be present.

SUMMARY AND CONCLUSIONS

Typical sciatic pain can be produced on a mechanical basis from a transitional lumbosacral vertebra. In 90% of the patients with unilateral sacralization of a vertebra proved at time of surgery, the sciatic radiation of pain was on the side opposite sacralization. In only 54% of instances could one be sure of the degree of the immobility of the transitional vertebra as determined from roentgenograms taken preoperatively. Disk herniation between the transitional segment and the sacrum was almost unknown in this series, since all but one of the herniations were at the level above the anomalous vertebra. One of the diagnostic points of sciatica caused by the transitional vertebra is that its onset is simultaneous with insidious back pain. Neurological signs, such as hypesthesia over the L-5 and S-1 dermatomes and a decrease in ankle jerk, were present in 15 negative disk explorations. This attests to the fact that one can have neurological changes without demonstrable nerve root pressure. Because of these findings, it is felt that the strain low in the back is transmitted to the joint above the transitional vertebra. For this reason, when surgery is required, the fusion is extended from the sacrum to the vertebra above the transitional segment. A successful fusion, as stated above, has eliminated back pain as well as the signs and symptoms of sciatic radiation of pain.

Summary of Results in Negative Disk Explorations

Case No.	Type and Duration of Low Back Pain	Neurological Signs	Spaces Explored and Findings	Results
1	2 yr., radiation midcalf, onset insidious	Absent right ankle jerk, SLR 90° bilaterally	1 space explored, L-4–L-5 (right)	Marie-Strümpell arthritis dorsal and lumbar spine, pain 2 yr.
2	7 yr., radiation to dorsum left foot, onset insidious	Neurologically negative, SLR 95° (left), 90° (right)	1 space explored, L-4–L-5 (left)	Asymptomatic 2½ yr.
3	5 mo., radiation left heel, onset insidious	Decreased sensitivity S-1 root, muscle weakness, decreased ankle jerk, SLR 120° (left), 90° (right)	3 spaces explored, L-3–L-4, L-4–L-5, L-5–S-1	Asymptomatic 3½ yr.
4	3 yr., radiation to dorsum left foot, onset insidious	Neurologically negative, SLR 135° (left), 90° (right)	1 space explored, L-4–L-5 (left), unstable L-4	Asymptomatic 2 yr.
5	2 yr., radiation left calf for 2 mo., onset insidious	Decreased sensitivity left thigh and calf	2 spaces explored, L-3–L-4 (left), L-4–L-5 (left), arthritic facets	Pseudarthrosis, intermittent back pain 4½ yr.
6	10 yr., radiation left calf 2 mo., onset insidious	Neurologically negative, SLR 135° (left), 110° (right)	2 spaces explored, L-4–L-5, L-5–S-1, unstable L-4	Asymptomatic 1 yr.
7	10 mo., radiation right calf, onset trauma	Decreased sensitivity right leg, SLR 135° (right), 90° (left)	2 spaces explored, L-4–L-5, L-5–S-1, unilateral sacralization	Continued back pain, same space reexplored, pseudarthrosis repaired. Asymptomatic 2½ yr. after repair
8	12 yr., one episode of right sciatica, onset insidious	Neurologically negative, SLR 135° bilaterally	3 spaces explored, L-4–L-5, L-5–S-1, S-1–S-2	Asymptomatic 1 yr.
9	3½ yr., radiation both thighs, numbness of right leg	Neurologically negative, SLR 135° bilaterally	2 spaces explored, L-4–L-5, L-5–S-1	Occasional right buttock pain, asymptomatic 2 yr.
10	2 yr., radiation left calf, onset trauma	Decreased sensitivity (left), decreased left ankle jerk, SLR 150° (left), 120° (right)	2 spaces explored, L-4–L-5, L-5–S-1, unstable L-5	Asymptomatic 2½ yr.
11	4 yr., pain radiation to left ankle 2 wk., onset trauma	Decreased sensitivity (left), decreased left ankle jerk, SLR 130° (left), 95° (right)	2 spaces explored, L-4–L-5, L-5–S-1, unstable L-5	Excellent result, 6 yr.
12	1½ yr., radiation left buttocks, onset insidious	Neurologically negative, atrophy of left buttock	2 spaces explored, L-4–L-5, L-5–S-1, asymmetry of facets	Asymptomatic 2½ yr.
13	20 yr., pain radiation to right heel for 9 mo., onset insidious	Absent right ankle jerk, decreased sensitivity right foot, SLR 120° (right), 95° (left)	2 spaces explored, L-3–L-4, L-4–L-5, marked asymmetry of facets	Asymptomatic 4 yr.
14	8 mo., radiation to both legs, onset trauma	Decreased sensitivity left leg, SLR 140° bilaterally	2 spaces explored, L-4–L-5, L-5–S-1, unstable L-5, arthritis of facets	Asymptomatic 2½ yr.
15	1 yr., radiation to left leg	Decreased left ankle jerk, decreased sensitivity left leg, SLR 145° (left), 90° (right)	3 spaces explored, L-3–L-4, L-4–L-5, L-5–S-1	Asymptomatic 9 yr.

SLR = straight leg raising test.

In four cases, it was felt that the springboard effect of unilateral sacralization of a vertebra was the cause of sciatica. The anatomic dissection of this type of anomaly by Moore [1] showed that the side with sacralization was more securely anchored and the foramen for the nerve root was wider than on the springboard side. We feel that many of the symptoms that are attributed to the transitional vertebra are due to the vertebra immediately above the transitional segment, which must assume the real function of motion of the lumbosacral joint; therefore, this makes the vertebra above the transitional vertebra potentially unstable. Because of this, it is our practice to include the segment immediately above the transitional vertebra when performing a fusion.

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1. Moore, B. H.: Sacralization of the Fifth Lumbar Vertebra, J. Bone & Joint Surg. 7: 271-278 (April) 1925.

CLINICAL NOTES

INTRACRANIAL HYPOTENSION SECONDARY TO LUMBAR NERVE SLEEVE TEAR

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The syndrome of intracranial hypotension is well known to anyone experienced with the lumbar puncture. This syndrome, which occurs within 12 to 24 hours after a puncture, may include nausea, vomiting, stiffness of the neck, and occasional fever of variable degree; it may progress even to the point of extreme prostration; yet the particularly noteworthy symptom is headache. A salient characteristic of this headache is its complete disappearance when the patient lies down and its prompt reappearance when he resumes the sitting position. This headache, which ranges the entire gamut of severity, is most frequently localized in the fronto-occipital area and is described as being of a thumping, throbbing type. Repeated observations tend to validate the premise that the headache is due to leakage of spinal fluid through a needle hole in the dura, since a second puncture usually reveals a low pressure. Mixter[1] has observed such a spinal fluid leak at operation six days after a puncture was made.

There are, of course, other causes for intracranial hypotention that do not involve either a puncture hole or a laceration of the dura; a decreased pressure is seen frequently in dehydration, subarachnoid block, diabetic coma, chronic degenerative disease, and hyperpnea and after the intravenous injection of a hypertonic solution.[2] Cerebrospinal fluid rhinorrhea due to a traumatic, inflammatory, or erosive lesion may also cause an intracranial hypotension, as may cerebrospinal fluid otorrhea when the same clinical situation exists in the petrous bone, the mastoid, or the zygomatic air cells. Admittedly, the clinical situation encountered here is somewhat different from that seen when the intracranial hypotension is produced by a cerebrospinal fluid leak following lumbar puncture. To the above-listed causes of intracranial hypotension I should like to add yet another, the leakage of cerebrospinal fluid through a dehiscence in a dural nerve sheath caused by indirect trauma. The summary of one such case encountered is presented here.

REPORT OF A CASE

When first seen, the patient stated that on Oct. 7, 1951, after finishing his meal in a small restaurant, he slipped backward from the stool on which he was sitting and apparently tripped. He fell on his buttocks and struck the small of his back against some object. There was no immediate pain. He got up and walked away, but a short time later he had a rather severe headache, which he relieved by lying flat. This headache became rather violent in intensity, with severe throbbing in the basofrontal region; the patient continued to be able to relieve it by lying down, but, because he was unable to sit up for any length of time without becoming quite ill with nausea and severe headache, he was admitted to the hospital on Oct. 9, 1951. There was no evidence of local external trauma in the lumbar region. The neurological examination revealed no abnormalities. Lumbar puncture, done with the patient in the lateral position, revealed an initial pressure of 50 mm. H_2O. Roentgenographic examination of the lumbar region revealed no fracture, though the transverse processes of the first lumbar vertebra were transitional and ununited. The clinical impression was that of intracranial hypotension secondary to a dural tear in the lumbar region. On Oct. 12, 1951, another lumbar puncture was done; it showed an initial pressure of 50 mm. H_2O with the patient in the lateral position. Cerebrospinal fluid examination showed 2 white blood cells and 7 red blood cells per cubic millimeter and 37 mg. of protein per 100 cc. Injection of 15 cc. of saline brought the pressure up to 150 mm. H_2O, but it rapidly returned to 50 mm. On Oct. 14, 1951, lumbar puncture was again performed, with the patient in the lateral position; the initial pressure was 50 mm. H_2O. Arterial and respiratory excursions were normal. The injection of 20 cc. of saline elevated the pressure to 150 mm. H_2O, but during a five minute observation period the pressure again fell to 50 mm.

Myelogram made by use of ethyl iodophenylundecylate (Pantopaque); arrows indicate leakage from lumbar nerve sleeve tears.

In order to confirm the diagnosis and to determine the location of the tear that was believed to be present, a myelogram was done, on Oct. 15, 1951, with 3 cc. of ethyl iodophenylundecylate (Pantopaque). The myelogram showed the contrast medium to be streaming out of the dural sleeve between lumbar vertebrae three and four into the epidural space on the right side; this confirmed the opinion of a dural tear. There was considerable extravasation of the contrast medium into the epidural tissue. The patient was then kept flat in bed for a period of 10 days, following which lumbar puncture was again done. The initial pressure with the patient in the lateral position was 110 mm. H_2O. The pressure with the patient upright was 240 mm. H_2O, the foramen magnum level being 500 mm. This level was fairly well maintained, though there was apparently some slow decline in pressure. In the hope of promoting a local irritation, 1 cc. of blood was injected into the lower spinal canal. The patient was again kept flat for three days; when he was allowed up, he was symptom-free.

A recheck lumbar puncture done before the patient was discharged showed the pressure to be well maintained in both positions; the initial pressure with the patient in the lateral position was 150 mm. H_2O and with the patient in the upright position, 480 mm. The patient remained symptom-free and was

Read before the Neurosurgical Society of America, Mackinac Island, Mich., July 24, 1954.

1. Mixter, W. J., in discussion of Fremont-Smith, F.; Merritt, H. H., and Lennox, W. G.: The Relationship Between Water Balance, Spinal Fluid Pressure, and Epileptic Convulsions, J. Nerv. & Ment. Dis. **76**: 176, 1932.

2. Merritt, H. H., and Fremont-Smith, F.: The Cerebrospinal Fluid, Philadelphia, W. B. Saunders Company, 1937, pp. 50 and 54.

discharged from the hospital three days later, on Nov. 1, 1951. When seen two months later he stated that he felt fine and had had no more headache or complaints of any kind; there were no neurological signs.

COMMENT

In this case of a patient who, without any previous or subsequent evidence of pressure disturbances in the central nervous system, had an acute syndrome of intracranial hypotension after a fall on his buttocks, it was established that headache was secondary to the loss of cerebrospinal fluid into the epidural space in the lumbar region. This was evidenced by: (1) relief of symptoms when the patient would lie down and production of symptoms when he resumed the upright position; (2) low initial pressure (50 mm. H_2O) at lumbar puncture with the patient in the lateral position; and (3) demonstration of contrast medium streaming out into the epidural space and particularly along the sheath of the right third lumbar nerve. The patient's recovery with the use of the conservative treatment mentioned is additional confirmation that the hypotension was due to leakage of the cerebrospinal fluid.

It is believed that the prime factor in the treatment of such a dehiscence in the dural sheath is the reduction of cerebrospinal fluid pressure; this can be accomplished simply by keeping the patient flat in bed long enough to permit healing to occur. The tendency of ethyl iodophenylundecylate to produce a local inflammatory change at the site of a tissue reaction in the nervous system is well known; a myelogram was made in an attempt to utilize this property, as well as for diagnostic reasons. The injection of 1 cc. of the patient's blood into the lower spinal canal was a further attempt at inducing an inflammatory reaction in this area, since blood, too, has irritant qualities, particularly in the presence of ethyl iodophenylundecylate. It is not possible to claim that an inflammatory reaction set up by the contrast medium or by the blood—or, indeed, by the combination of both—resulted in the sealing over of the lacerations in the nerve sheaths; it is strongly suspected, however, that the use of these agents in combination with the decrease in intraspinal pressure accomplished by keeping the patient flat resulted in the hastening of his recovery.

It is interesting to speculate on the mechanics involved in the production of this leak. The spinal dura, with its finger-like extensions with openings directed cephalad and enveloping the nerve roots to their emergence at the intervertebral foramen, may be regarded as a relatively inelastic membrane. The angle of emergence of the dural sleeves ranges from almost a right angle in the cervicodorsal region to a very oblique angle in the lumbosacral area, where the sheath almost parallels the median axis of the canal. In this region, the cone-like shape of the sleeves at their point of emergence facilitates the collection and focalization of shock waves, one of the factors believed to be largely responsible for the production of a nerve sleeve laceration. A propagated pressure wave is induced by the effect of the sudden deceleration of the body on the momentum of the cerebrospinal fluid mass. Another important factor is the abrupt change in the intra-abdominal pressure caused by the tension of the thoracic and abdominal musculature, with subsequent reflected changes in the venous and spinal fluid pressures. The cycle of events set up at the moment of impact is believed to be as follows: with the deceleration of the body to zero at the moment of impact, the sudden change in the intra-abdominal pressure is reflected by a sharp rise in the spinal fluid pressure. At the same instant a shock wave progresses caudad because of the sudden arrest in the linear momentum of the cerebrospinal axis. Little effect is noted on the cervicodorsal sheaths because of their right-angle emergence from the canal; however, where the obliquity is greater and the mouths of the sheaths are directed upward to receive the shock wave, this force is gathered within these cones. When the dural cone is strong enough to withstand the sudden increase in pressure, no tear will result. However, in this instance, possibly because of a local weakness in the sheath or, as suggested by Cloward,[3] the existence of a meningeal diverticulum (spinal extradural cyst),[4] the force was enough to cause a dehiscence in its fibers that resulted in leakage of cerebrospinal fluid into the epidural structures.

Further work will be necessary to prove or disprove this hypothesis. Because of the large incidence of falls in a sitting position that result in no greater damage than an injured dignity and because of the relative infrequency of the production of this syndrome. It is believed that some preexisting weakness of the dural sheath is probably a factor necessary for the establishment of intracranial hypotension secondary to lumbar nerve sleeve tear.

SUMMARY AND CONCLUSIONS

The case of a patient with intracranial hypotension secondary to a laceration of a lumbar nerve sleeve caused by a fall on the buttocks is offered as evidence that laceration of the lumbar dural nerve sheaths, with subsequent leakage of the cerebrospinal fluid into the epidural tissue, may result from an indirect trauma and may cause intracranial hypotension. It is believed that the cone-like shape of the dural sleeves in the lumbar region at their point of emergence, the pressure wave induced by sudden deceleration of the body, the abrupt change in intra-abdominal pressure caused by tension of musculature, and probably some preexisting weakness of the dural sheath combine to create lumbar nerve sleeve tear in the absence of direct trauma.

10515 Carnegie Ave. (6).

3. Cloward, R. B., in discussion of this paper.
4. Cloward, R. B., and Bucy, P. C.: Spinal Extradural Cyst and Kyphosis Dorsalis Juvenilis, Am. J. Roentgenol. 38: 681-706, 1937.

Physician, Heal Thyself.—It is a common observation that doctors pay more attention to their patients' health than to their own. . . . The finger of shame is pointed at us by Byrd as a result of his survey on the interval which elapsed from the onset of the first symptoms of a neoplasm until the physician-patient presented himself for examination. He found that this interval averaged seven months in the case of carcinoma of the lung, nine months in malignancy of the gastrointestinal tract and 14 months between the first symptoms of carcinoma of the prostate and the initial examination. Small wonder that in only 19 of the 60 physicians in his series were palliative operations done and in only five of the 60 were curative procedures carried out. Truly as the Scriptures say, we are "blind leaders of the blind. And if the blind lead the blind, both shall fall into the ditch."—Harry F. Dowling, M.D., Physician, Heal Thyself, *GP*, January, 1955.

PANCREATITIS WITH RUPTURE OF SPLEEN AND HEMORRHAGIC PLEURAL EFFUSION

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Rupture of the spleen without apparent cause is a relatively unusual condition, only a few cases having been reported prior to this time. The following case is presented as a spontaneous rupture of the spleen; however, we feel that in this instance the predisposing conditions can be adequately explained.

REPORT OF A CASE

A 42-year-old white woman was admitted on the medical service of Vanderbilt University Hospital on March 15, 1954, seven hours after the sudden onset of severe left upper abdominal pain with associated tenderness. The pain was intermittent, was of gradually increasing intensity, and was described as cramping in character. There had been a similar episode of pain 10 days prior to admission, but this had subsided spontaneously after four or five hours. The patient's past history was not remarkable except for the fact that over a period of two and one-half years she had had repeated episodes of midepigastric pain that radiated through to her back. She had been carefully examined after one such episode, eight months prior to admission; at that time it was felt she probably had been having repeated episodes of pancreatitis. This diagnosis was supported by the roentgenographic demonstration of diffuse calcification in the pancreas (fig. 1). No other abnormality could be found on radiographic studies of the gallbladder and gastrointestinal tract.

Examination of the patient at admission revealed marked tenderness, with muscle spasm, in the left upper quadrant of the abdomen. Temperature was 97 F, blood pressure 120 mm. Hg systolic and 90 mm. Hg diastolic, pulse rate 100 per minute, and respiratory rate 22 per minute. The remainder of the physical examination revealed no abnormalities. Admission laboratory

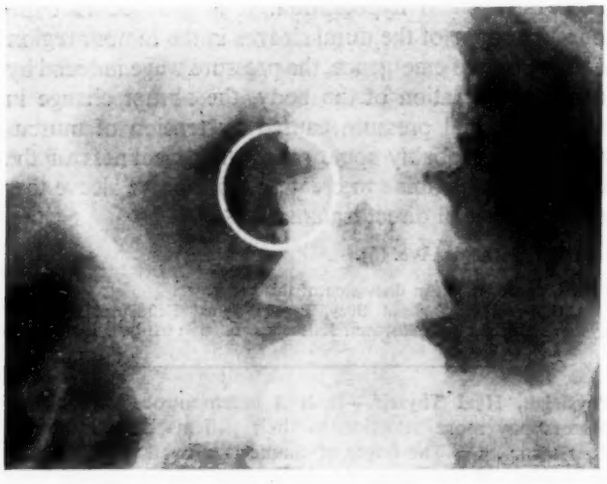

Fig. 1.—Preoperative roentgenogram showing diffuse calcification in the pancreas.

studies showed a hematocrit value of 36.9%, a white blood cell count of 10,750 per cubic millimeter, and a hemoglobin value of 11 gm. per 100 cc. The urine contained numerous red and white blood cells in addition to hyaline and granular casts. There was a 1+ albuminuria. The serum amylase level was 200 Somogyi units per 100 cc. The nonprotein nitrogen level was 29 mg. per 100 cc. The patient was kept under observation for the next 10 days. Retrograde pyelograms revealed no abnormalities. A gastrointestinal series revealed a very large, homogeneous, circumscribed, retrogastric mass. The most likely diagnosis was thought to be a large pancreatic cyst in the body of the pancreas. On the patient's third hospital day, fluid began to accumulate in the left hemithorax, and on the seventh hospital day 450 cc. of bloody fluid was aspirated. A Papanicolaou stain of the sediment of this fluid was examined; it was thought to show malignant cells, in groups and scattered, and to indicate metastatic carcinoma of the pleura.

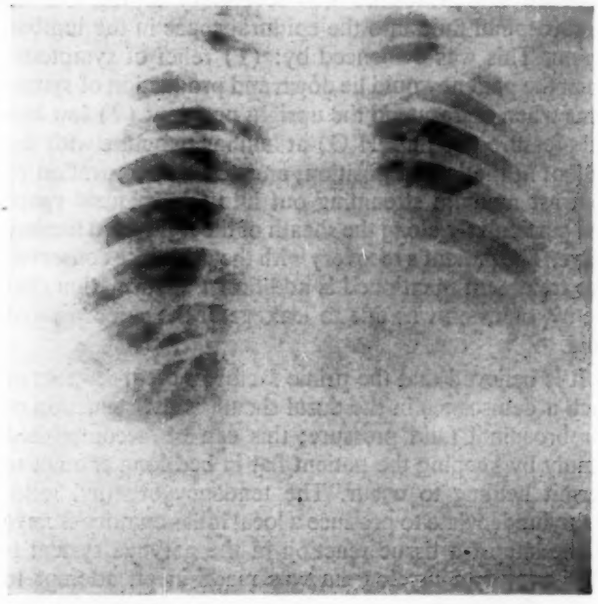

Fig. 2.—Roentgenogram of chest showing fluid in left pleural cavity.

It was felt this patient probably had pseudocystic carcinoma of the body of the pancreas, with pleural metastases. An exploratory operation was performed on March 26, 1954, to establish a diagnosis. At laparotomy a large mass was found occupying the left upper quadrant of the abdomen. This proved to be a tremendous hematoma arising from a rupture of the spleen laterally near its inferior pole. The pancreas showed diffuse induration compatible with the changes of chronic pancreatitis. The capsule of the spleen was densely adherent to the diaphragm, stomach, pancreas, and duodenum. Removal from these structures could be accomplished only by sharp dissection. At the conclusion of the operation the space previously occupied by spleen and hematoma was dry. The patient withstood the operation satisfactorily; 5,500 cc. of whole blood was given during the procedure. Examination of the specimen in the surgical pathology laboratory revealed no abnormality other than perisplenitis. The postoperative course was uneventful, and the patient was discharged on the ninth postoperative day in excellent condition. The fluid has not reaccumulated in her chest after a period of four months; she has had no recurrence of her pancreatitis and is apparently well.

COMMENT

This case is reported because of two interesting clinical entities. The rupture of the spleen was apparently the result of the many perisplenic adhesions that followed the rather severe bouts of pancreatitis. Close questioning failed to reveal any history of even slight preceding injury. It is a well-known fact that in a partially mobile organ the point of attachment is most vulnerable to a shearing injury. The adhesions in this instance probably served as the basis for rupture from some minor jarring force. It is surprising that the relationship between "spontaneous" rupture of the spleen and pancreatitis has not been pointed out before this time, but no previous re-

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port can be found. The second unusual aspect of this case is the hemorrhagic pleural effusion associated with rupture of the spleen without injury to the thoracic cage. One previous instance of such an effusion associated with rupture of the spleen not due to direct trauma has been reported. In that patient [1] the basis for the splenic rupture was multiple septic infarcts; the left pleural effusion was associated with a supradiaphragmatic abscess, the infection apparently having extended up through the diaphragm.

SUMMARY

In a patient with rupture of the spleen and associated hemorrhagic pleural effusion, the splenic rupture was apparently the sequel of perisplenic adhesions due to recurring episodes of pancreatitis. The concomitant bloody pleural effusion is unique in medical literature. No previous relationship between splenic rupture and pancreatitis has been reported.

2122 W. End Ave. (5) (Dr. Byrd).

1. Turner, G. G.: Spontaneous Rupture of the Spleen, Lancet 1: 799-801, 1917.

SPECIAL ARTICLES

DRUG-INDUCED MOOD CHANGES IN MAN

2. PERSONALITY AND REACTIONS TO DRUGS

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In an investigation in the anesthesia laboratory of the Harvard Medical School of mood and other psychological changes induced by a variety of drugs, an opportunity arose to correlate the personality of the subjects involved and the nature of their responses. This was of interest because of the likelihood that the preexisting mental state of a person would affect his psychological responses to drug stimulation. Our results support this assumption and are presented, despite the relatively small number of subjects involved, because of the scarcity of such data in the literature. They indicate profitable areas for further study.

METHODS

The subjects, drugs, and procedure for eliciting subjective responses are described in a previous paper by us.[1] The volunteers were 20 healthy young males, aged 21 to 27 years, and were, with a few exceptions, college students. Psychological data on each subject consisted of an interview, which lasted from one to three hours, and a Rorschach examination; both were obtained on a day when no medicament was administered. The interview did not follow a rigid pattern. Aside from a few questions that were asked if certain information did not spontaneously arise (such as drug and alcohol use and medical history) the situation was generally presented to the subject as a desire on the part of the interviewing psychologist to get to know as much as possible about him and what sort of person he was, since the psychologist was interested in the relationship of drug reactions and personality. The interview thus presented a fairly standard problem in interpersonal relations, and the way the subject handled it was more useful in evaluating such things as motivations and personality characteristics than the content, which was often a dull school and work history. A summary sheet on each subject was then drawn up, consisting of a series of statements about the subject based on the interview material and behavior. These statements attempted merely to rephrase the interview data in simple psychological terms such as: "Little drive for achievement—a drifter," "still retains a passive and dependent relationship to family," "tends to worry," "recognizes strong depressive trends," "active and aggressive in goal achievement," "brilliant, creative, and imaginative." Data were kept at this descriptive level both to avoid the possible bias of inaccurate integration and to permit composite pictures of groups of subjects to be developed. The Rorschach tests were administered and scored by another psychologist, and these data plus statements as to projective content were added to the interview summary statements. Neither psychologist was aware of the nature of the responses to the drugs until the above data were accumulated.

The correlation of personality and response to drugs was made in terms of typical and atypical reactions regarding mood and state of wakefulness. For example, the most frequent responses to amphetamine were euphoria and alertness; to heroin and morphine, dysphoria and sedation; and to pentobarbital, euphoria and sedation. These reactions were thus called typical. The opposite responses for each drug were labeled atypical. For each drug, therefore, a comparison has been made of the persons with typical and atypical reactions. Because of the tendency for subjects to have an atypical reaction to more than one drug, an analysis has also been made of persons with typical reactions in general versus persons with atypical reactions. Finally, the responses have been examined for the incidence of persons who responded similarly (e. g., with euphoria) to all or most drugs.

In order to sharpen the focus of the analysis, only instances of definite, clear-cut responses in one direction or another were considered. Slight reactions or complex responses, e. g., euphoria followed by dysphoria, were not used. An exception to this occurred in the analysis of reactions to pentobarbital and will be described later. Despite the resultant diminution in size of groups, it was believed that the gain from this procedure outweighed the disadvantages. It is important to bear in mind that the descriptions of each group are artificial compositions, an average picture, and that individual deviations tend to be obscured in such a composite group picture. These deviations point up the presence of important variables that were not determined by the present study.

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1. Lasagna, L.; von Felsinger, J. M., and Beecher, H. K.: Drug-Induced Mood Changes in Man: 1. Observations on Healthy Subjects, Chronically Ill Patients, and "Postaddicts," J. A. M. A. 157: 1006 (March 19) 1955.

RESULTS

Amphetamine.—As shown in a previous paper by us,[1] the predominant reaction to amphetamine was a euphoric one. Only 4 out of 20 subjects had a distinctly dysphoric reaction. While such a small group cannot be expected to give a dependable average, the infrequency of this reaction emphasizes its importance. Because the typical group comprised so large a percentage of the total experimental group, it is difficult to characterize except in broad terms. Therefore, the analysis for mood response under amphetamine centers on the atypical group.

The whole group of 20 subjects was in general characterized by a high degree of motivation and goal orientation in regard to college achievement and preparation for the future. The four subjects in the dysphoric subgroup stood out as conspicuously lacking in these qualities. The terms "low motivation" and "drifter" appear in all their records. Their academic achievement was low. While evidence of family pressure is often detectable in the behavior of a college group, pressure by the fathers of these four subjects for their sons' achievement constituted a long-standing problem and was apparently the single most important factor in the father-son relationship. Perhaps understandably, these four subjects revealed (in three cases spontaneously) a pervading sense of failure or inadequacy in meeting life's demands. This was closely related to passive-dependent relationships to their mothers ("She always took my part"). Interestingly, only 3 of the total group of 20 subjects were married, and 2 of the 3 were in the group with a dysphoric reaction to amphetamine. These two had obviously transferred the passive-dependent mother relationship to the wife, both stating that marriage was mostly "my wife's idea" and depending for all decisions on her. The same two subjects were the heaviest consumers of alcohol of the total group. All four felt a release of pressure from drinking alcohol, and they were suspected of having neurotic causes for their drinking. Significantly, their Rorschach tests and their descriptions of drug reactions revealed a fear of loss of control under any type of pressure. The median number of Rorschach responses of these four subjects was the lowest (25) of any group. This is strikingly low responsivity for college men and undoubtedly reflects the low level of motivation mentioned above. Passivity and dependence were confirmed in the Rorschach content. There was a striking emphasis on restrictive control, which, in conjunction with a dominance of C over M, suggests a conscious fear of losing control over emotions. This latter problem is pointed up by the fact that three of the four subjects had the highest anxiety-hostility scores of all subjects below the median response level. The latter qualifying phrase is necessary because the number of anxiety-hostility responses is in part a function of the total number of responses.

The Rorschach scoring used here is based primarily on Klopfer and Kelley.[2] Scoring is in terms of determinants of the response: form (F), movement, human and animal (M and FM), color (C), more or less integrated with form (FC, CF), shading (c), and achromatic color (C'). F + % is the percentage of form-determined responses occurring with great frequency in an average group. W, D, and Dd refer to the area of the blot used in the response—whole, usual part, unusual part. Hostility and anxiety scores are weighted responses, so classified because of the content, according to Elizur.[3] Interpretation of the determinants is derived from empirical demonstration and from consideration of genetic development. For example, response to color in the cards is empirically related to the initiation of affective experience, and, genetically, color responses develop from pure C responses at about 3 years of age to a gradual occurrence and dominance of CF at about 6 or 7, followed by a gradual increase of FC responses, which normally become dominant over C and CF in the postadolescent period. Interpretation of an individual record depends, however, not only on this rationale but also on the context of other determinants in a record. Principles involved have been extensively discussed by Phillips and Smith.[4]

An interesting result of the study was the description of sedation after the use of amphetamine. The five subjects showing definite sedation and the seven markedly stimulated subjects will be contrasted here. Characterization of the stimulated group is more difficult than for other groups in the sense that a wider range of variables is mentioned in their summary sheets and few factors are emphasized. They tended to be the most responsive and expansive persons in the interview situation, handling the situation easily and talking freely. They were soundly motivated and doing well in college work. Their adjustment to sex problems was at a more mature level than in other groups. In line with these impressions, this group had the highest median number of Rorschach responses (56) and used the greatest number of determinants. This group had a balanced Rorschach picture in that the relation of movement to color responses (M:C) was within the optimal range. This supports the impression of a balanced development in this group of affective responsivity and mature control functions that is characteristic of the socially well-adjusted person. A similar balance is displayed in the W:M ratio, in which a number of organized wholes approximately equal to the number of movement responses is usually related to a satisfactory work or social adjustment. In these terms then, they constituted our best adjusted or normal group. The alcohol habits of this group were social, and the effects were always to release inhibitions. They became more talkative, expansive, "freer with the girl friend," and euphoric after alcohol.

The group of five persons who felt sedated by amphetamine presented undesirable characteristics, as did the group with a dysphoric reaction to amphetamine and the group with a euphoric reaction to opiates (*vide infra*). Strong depressive trends and moodiness were frequently coupled with unrealistic and diffuse goals and ambitions. The Rorschach data supported the interview evaluations in these regards. The number of responses to this test was low, with a median of 32. Depressive responses were prominent, as expressed in morbid content and in responses to black color (C'). Marked imbalance in both ratios previously described was present. For this number of responses one might expect a W:M

2. Klopfer, B., and Kelley, D. M.: The Rorschach Technique, Yonkers-on-Hudson, N. Y., World Book Company, 1946.
3. Elizur, A.: Content Analysis of the Rorschach with Regard to Anxiety and Hostility, J. Projective Techniques **13**: 247 (Sept.) 1949.
4. Phillips, L., and Smith, J. G.: Rorschach Interpretation: Advanced Technique, New York, Grune & Stratton, Inc., 1953.

ratio of 2:1; in this group it was 5 to 1. Such preponderance of W is considered to be associated with chronic immaturity and intellectual striving beyond capacity. The M:C ratio (1:2) contrasts with the alert group by C dominance, which, while acceptable per se, in context with the total picture emphasizes immaturity and instability and implies poor judgment and inadequate controls over emotionality. Of interest is the fact that alcohol also tends to sedate and depress this group in contrast to the group that is stimulated by amphetamine. Sex interests and concerns are at a minimum in this group of persons, who appeared to possess low sexual drive for their age.

Heroin and Morphine.—In contrast to the results with amphetamine, the majority of our volunteers considered the opiates to be unpleasant. Our examination here will center on the 7 (out of 20) who responded unequivocally with euphoria to heroin or morphine or both. This group is characterized particularly by immaturity, impulsiveness, and self-centered and emotional tendencies. The Rorschach M:C ratio is 1:3, which, together with the frequent presence of pure color responses (C), indicates adults whose adjustment techniques are fixed at, or have regressed to, an immature level and who are likely to be self-centered, demanding, and impatient at delay in immediate gratification of desires. This interpretation is supported by interview data. Members of this group often used the word selfish, in a rather self-satisfied tone, in describing themselves. Narcissism or heightened self-esteem is characteristic of the group, but seems of a defensive nature. As might be expected, five of the seven subjects are above the median score for their respective response level in the analysis of anxiety-hostility content.

Of particular interest in this group, in view of current theories of drug addiction, is the tendency for these subjects to use fantasy for the solution of problems and gratification of their needs. This use of fantasy ranged from excessive daydreaming in four subjects to a somewhat embarrassed admission by another of an imaginary friend who is his constant companion and ego ideal. Another subject, a law student at the bottom of his class, spoke at length and seriously of amassing a fortune in Alaska in two years and then returning to a life of night clubbing and resort living. Another was so preoccupied with the absence of love and brotherhood in the world that his college work was seriously disturbed. This situation was reflected in the imbalance of the Rorschach W:M ratio (11:4). Such imbalance is usually associated with persons who are unrealistically ambitious and grandiose in their projects. The low F + % (33) of the group suggests weak conscious control of behavior. This, together with such poorly directed striving and uncontrolled emotionality, poses the question of why there is no evidence of serious antisocial behavior in this group. One suspects that the above conditions in a group of less intelligent and less socially and economically favored persons would result in serious behavior disorders. It seems reasonable that a sedating or withdrawing drug would be experienced as pleasant by persons with such precarious balance.

As in the case of the persons with a typical (euphoric) reaction to amphetamine, the group of persons with a typical (dysphoric) reaction to opiates is difficult to characterize, other than that those factors discussed in reference to the group with a euphoric reaction to opiates are within normal limits. Two findings of interest are the low median R (38) that seemed to be associated with our groups with a dysphoric reaction and the frequent incidence of C′ responses (usually considered depressive signs) in the six persons with the most dysphoric reactions.

All but 2 of our 20 subjects were sedated by the opiates. One of these, although not sedated, had a distinctly unpleasant reaction to the opiates and responded in typical fashion to other drugs. The other subject had no reaction at all other than an itchy nose and an ache at the site of injection. It is interesting that this latter person was the only one in the total group thought by the psychologists to be of psychopathic character (marked absence of usual social and ethical values in the determination of behavior and of emphatic identification with others). Two other psychopathic personalities with whom we have had experience in a previous study also minimized their reactions to various drugs.

Pentobarbital.—The typical reaction to pentobarbital was one of sedation. While the degree of sedation varied, only 2 subjects out of 20 felt actually stimulated and made more alert by the drug. These two were also atypical in their response to opiates, reacting with euphoria. Of the other 5 atypical opiate reactors, 3 were only slightly sedated by pentobarbital (only 5 of the 17 sedated subjects were designated as being slightly sedated). Thus, five of the seven persons with an atypical reaction to opiates also had an atypical reaction to pentobarbital in regard to sedation.

As to the mood changes, 9 out of 20 responded with euphoria and 5 with dysphoria. Because many of these reactions were slight, an exception was made to the previously described general rule that only marked responses would be considered. Again several factors turn up as consistently related to type of reaction irrespective of drug. We found the group with a euphoric reaction to be more responsive on the Rorschach test (median of 52 responses to 39 for the group with a dysphoric reaction). Again the subjects with a euphoric reaction were the more facile and adaptable in the nondrug interview situation. Other Rorschach indexes for the persons with typical reactions were much like the total group scores, and the significant ratios were in the optimal range. Alcohol tends to have a euphoric and releasing effect on this group, although their consumption is not great.

The persons with a dysphoric reaction were less responsive than the group with a euphoric reaction on the Rorschach test as well as in the interview situation. With one exception, the persons with a dysphoric reaction were all characterized as relatively lacking in self-confidence. The W:M and M:C ratios showed imbalance (2:1 and 3:8 respectively), as had been the case with persons with an atypical reaction to other drugs. Attempts at conscious control of emotion were more evident, however, than in the group with a euphoric reaction to opiates, and the presence of depressive signs both in the interview and in Rorschach data were less than in the group sedated with amphetamine. In contrast to the group with a euphoric reaction to pentobarbital, alcohol was reported to have a depressing or saddening effect in the group with a dysphoric response that was similar to its action in the group sedated with amphetamine.

Placebo.—As reported in a previous paper by us,[1] 5 of the 20 subjects had no effect from placebo (1 ml. of sodium chloride solution given subcutaneously), 9 had slight effects that were not felt to be due to the drug, and the remaining 6 subjects had definite changes that they attributed to the injection. Five of these had pleasant reactions, and one had an unpleasant reaction. Of these six persons who reacted to the placebo, four had an atypical reaction to opiates and one more, though not included in the group with an atypical reaction, experienced a slight pleasant reaction to the opiates. The persons reacting to the placebo may best be characterized in the same terms as the atypical reactors as a whole, who are described below.

Atypical Reactors.—As apparent, there was a tendency for the atypical groups described for the various drugs to be comprised of the same persons. This phenomenon becomes more significant when one considers that persons with an atypical reaction to one drug, when not called atypical in the case of another drug, were frequently eliminated not because of a definitely typical response but because of no response or a slight response of some sort; thus, of the eight persons with an atypical reaction, i. e., either dysphoria or sedation or both, to amphetamine, four had a definitely atypical (euphoric) response to opiates, two had a slight atypical response, one had no reaction, and only one had a definitely typical (dysphoric) response.

Median Rorschach Scores of Typical Versus Atypical Groups

	Typical	Atypical
M:C *		
Amphetamine (Mood)	4:5	1:2
Amphetamine (Stimulation)	1:1	1:2
Pentobarbital (Mood)	1:1	3:8
Opiates (Mood)	5:4	1:3
	All Subjects—4:5	
W:M		
Amphetamine (Mood)	3:2	4:3
Amphetamine (Stimulation)	1:1	5:1
Pentobarbital (Mood)	7:5	2:1
Opiates (Mood)	6:5	11:4
	All Subjects—3:2	
R		
Amphetamine (Mood)	46	25
Amphetamine (Stimulation)	56	32
Pentobarbital (Mood)	52	39
Opiates (Mood)	38	42
	All Subjects—39	

* M:C = ratio of human movement responses to color-determined responses, W:M = ratio of whole area responses to human movement responses, R = number of responses given to the cards.

If those seven persons who fall into at least two of the four major atypical groups (dysphoric after amphetamine, sedated after amphetamine, euphoric after opiates, and dysphoric after pentobarbital) are selected, a composite picture emerges that is, of course, similar to that already described under the individual drug sections. The two other groups with atypical reactions—stimulation (or lack of sedation) from opiates and stimulation from pentobarbital—were comprised of only two subjects respectively. However, all of these had an atypical reaction to other drugs and thus are accounted for in the four major groups with atypical reactions.

To recapitulate, the following characteristics of these persons with atypical reactions stand out in contrast to the larger group of persons with typical reactions. 1. They are immature persons dominated by impulsive and egocentric tendencies and inadequately controlled emotions. Control functions of the personality and socialized habits are not sufficient to balance impulsiveness. The person is frequently consciously aware of this problem, and external behavior can thus be deceptively controlled under ordinary, nonstressful circumstances. 2. They show strong but diffuse striving for achievement and prestige beyond their capabilities. This striving is frequently unrealistically directed, often into fantasy. 3. Additional signs of immaturity and precarious control of behavior, such as Rorschach pure C responses and depressive signs, such as moodiness or recurrent depressed periods, as well as Rorschach C′ responses, are more frequently encountered in this group than in the larger typical group. 4. They constitute the most anxious and hostile members of the entire experimental population. All are above the median in anxiety-hostility scores.

In the table, the Rorschach data on the M:C and W:M ratios are presented, as well as the number of responses for the groups with typical and atypical reactions. It will be seen that the groups with typical reactions had more responses, with the exception of the group receiving opiates, than the groups with atypical reactions. The group receiving opiates was, of course, the only group with typical reactions that was characterized by a dysphoric reaction. As previously stated, the six persons with the most dysphoric reactions in this group actually had a median number of Rorschach responses of 28. It thus appears that the number of responses is more closely related to euphoria-dysphoria propensities than to typicality of response.

"Consistent" Reactors.—No subject had consistently euphoric or dysphoric reactions to all drugs. This is not surprising, since the commonest reaction to amphetamine was euphoria and the commonest reaction to the opiates was dysphoria. Four subjects were consistent to the extent that three drugs out of the four given produced dysphoria, and six others responded pleasantly to three of the four drugs. With one exception, the four persons with consistently dysphoric reactions were in the group with a dysphoric reaction to amphetamine. The persons with a consistently euphoric reaction were, again, with one exception, persons with a euphoric reaction to opiates. Thus both consistent groups have in essence been described as atypical reactors in preceding sections.

COMMENT

The view that personality is important in the determination of drug reactions is not new. In 1934, Lindemann and Malamud [5] stated: "Each drug undoubtedly has certain characteristics but these are quite closely related to the conditions of the patients which are present when these specific effects are produced. The changes produced by a given drug will not only be elaborated on in the light of the preexisting psychic state but totally new types of reaction may result from such an inter-relationship." In spite of such early formulations of the problem, progress

5. Lindemann, E., and Malamud, W.: Experimental Analysis of Psychopathological Effects of Intoxicating Drugs, Am. J. Psychiat. **90**: 853 (Jan.) 1934.

has been slow, and the interest of most investigators has been directed primarily to the drug per se. Recent reports of the mental effects of such drugs as cortisone and *d*-lysergic acid diethylamide have renewed interest in the interdependence of personality and drug effects. Certainly the importance of this interrelationship of drug and the preexisting condition of the subjects has not been given much attention by pharmacologists or by physicians. This is true in spite of the fact that many agents of interest to the pharmacologist have as their primary purpose the alteration of subjective responses. While the subjective and psychological components of the reaction to narcotics have been noted in the function of these drugs as analgesic and addicting agents, medical textbooks describe these psychological responses as universal and specifically related to the action of the drug, as the following quotations illustrate. The data reported here demonstrate that this does not seem to be the case.

> When moderate amounts of morphine are given [up to 15 mgm.] human subjects soon experience an euphoric, exhilarating drowsiness characterized by freedom from anxiety . . . vomiting . . . is not associated with the usual unpleasant emotional reactions, even when it is violent and repeated. . . . The danger of heroin lies in the ease with which addiction to it occurs, due to the intense euphoria. . . .[6]

> [Morphine] . . . tends to produce a state of emotional tranquility, equanimity, well-being and buoyance [euphoria], sometimes of elation and ecstasy. . . .[7]

> Often an outstanding effect of small doses of morphine is euphoria. The individual becomes happy, jocose and even scintillating in conversation. . . . The marked euphoria produced by [heroin] leads to great danger of addiction.[8]

> Diacetylmorphine [heroin] produces marked euphoria. . . . Morphine decreases unpleasant general sensations. . . . *Euphoria* is produced.[9]

> After small quantities [of morphine] . . . the sleep . . . may resemble a state of abstraction or "brown study." In this condition [euphoria] the imagination is not depressed to the same extent as the reason. . . .[10]

> [Heroin] produces vicious addiction, owing to the readiness with which it elicits euphoria.[11]

The impressive reputation of the opiates as dangerous euphoriants in normal persons seems largely based on the writings and experiences of celebrated literary figures such as De Quincey, Coleridge, Baudelaire, and Cocteau and on the unqualified transfer of the results of studies on drug addicts (such as those described by these writers) to nonaddicts. The fact that many agents are capable of producing euphoria in addicts emphasizes the importance of the addict rather than the drug. Thus the opiates and all the newer synthetic analgesics, barbiturates, amphetamine, cannabis, antihistaminic agents, and large doses of such agents as acetylsalicylic acid, methyl alcohol, nutmeg, coffee, and Coca Cola [12] are reported as producing euphoria in drug addicts.

More recent work on drug-induced euphoria has attempted to relate euphoria to the action of the drug on certain dynamic processes of the personality, as well as postulating differential relationships between specific agents and processes. Thus, gratification of primary needs such as hunger and sex, and relief of pain, or reduction of the drive consequent to these needs, could result in the euphoric state. It has been suggested that the opiates work in this fashion.[12] Another possible avenue of effects lies in the reduction of inhibitions of psychodynamic mechanisms that have been developed by the person for the gratification (in actuality or in fantasy) of primary needs or of acquired needs such as dependence, passivity, aggression, or exhibitionism. Alcohol, barbiturates, cocaine, and amphetamine may act in this fashion.[12] These agents are said to be further differentiated from the opiates, since they may actually enhance the primary needs rather than reduce them.

The nature of the perceptual processes and the action of drugs on these processes have been emphasized by Lindemann and Clarke.[13] From this standpoint, the reduction of perceptual cues or the modification of their emotional or painful implications at a cortical integrative level by drugs such as morphine or pentobarbital may constitute a pleasant state. The total personality may react with either pleasant or unpleasant affect to a modification of the perceptual processes by drugs. Thus the shift of emphasis from external stimuli to internal imagery and proprioception, frequently noticed after a drug such as mescaline, can result in either satisfaction or apprehension, depending on the personality and situation. The affective change may therefore be visualized as not directly determined by the drug but related to the alteration by the drug of such psychic factors as needs, drives, or perception, and the change then experienced with pleasure or alarm, depending on the total psychic structure.

It is perhaps easier to appreciate the role of psychological dynamics in the secondary drug reactions that sometimes supersede an initial and more expected one. These reactions are most easily understood as the result of the operation of integrative functions of the personality that operate to adjust behavior to an acceptable compromise between internal processes and reality demands, or, stated another way, constitute restitutive efforts on the part of a threatened personality organization to preserve its integrity or reestablish its equilibrium. Altering the internal components of this balance may create fear or panic, and great efforts may be made to integrate the change in an emotionally acceptable manner.

It is evident that a comprehensive pharmacological study of the classes of drugs considered here presents a different problem from that usually considered by the pharmacologist. These agents are, however, no less in

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6. Goodman, L., and Gilman, A.: The Pharmacological Basis of Therapeutics: A Textbook of Pharmacology, Toxicology and Therapeutics for Physicians and Medical Students, New York, the Macmillan Company, 1941.

7. Soliman, T.: A Manual of Pharmacology and Its Application to Therapeutics and Toxicology, ed. 7, Philadelphia, W. B. Saunders Company, 1948.

8. Salter, W. T.: A Textbook of Pharmacology: Principles and Application of Pharmacology to the Practice of Medicine, Philadelphia, W. B. Saunders Company, 1952.

9. Meyer, H. H., and Gottlieb, R.: Experimental Pharmacology as a Basis for Therapeutics: A Textbook for Students and Physicians, ed. 2, translated by V. E. Henderson, Philadelphia, J. B. Lippincott Company, 1926.

10. Cushny, A. R.: Pharmacology and Therapeutics, ed. 12, revised by C. W. Edmunds, and J. A. Gunn, Philadelphia, Lea & Febiger, 1940.

11. Krantz, J. C., Jr., and Carr, C. J.: The Pharmacologic Principles of Medical Practice: A Textbook of Pharmacology and Therapeutics for Medical Students, Physicians, and the Members of the Professions Allied to Medicine, Baltimore, Williams & Wilkins Company, 1949.

12. Wikler, A.: Mechanisms of Action of Drugs that Modify Personality Function, Am. J. Psychiat. **108**: 590 (Feb.) 1952.

13. Lindemann, E., and Clarke, L. D.: Modification in Ego Structure and Personality Reactions Under the Influence of the Effects of Drugs, Am. J. Psychiat. **108**: 561 (Feb.) 1952.

his domain than other drugs. Neglect of these problems would either exclude certain drugs from his field or limit his understanding of their range of activity.

Appraisal of Results.—Our own study was not oriented around any particular hypothesis as to interrelationship of drug and personality but merely attempted to find any correlations that might exist. The results suggest that there is indeed a connection between subjective responses after drugs and the personality state of the subject. Such a finding is perhaps less surprising than the failure to establish a correlation would have been. Certainly the functional state of an organ like the heart can affect the response of an organism to drugs that act on the heart, and the physiological condition of the kidneys may alter the response to diuretics. Thus there is no occasion for surprise that the state of the central nervous system (as reflected, albeit imperfectly, in the personality structure) may affect the response to drugs acting primarily on the central nervous system.

Even if one accepts this view, a basic question remains: Are the effects of a given drug reasonably uniform from person to person and the subjective reaction of dysphoria or euphoria primarily an interpretation of, or reaction to, such effects, or is there a basic difference in the intrinsic effects of the drug from subject to subject? There is good reason to believe that there is no particular differential susceptibility or tolerance to at least certain effects of morphine, such as nausea and vomiting. Most addicts seem as likely to get sick as nonaddicts on first exposure to the drug.

We hoped in the present study to screen out some of the more important psychological variables associated with the euphoria-dysphoria and stimulated-sedated reactions and thus permit the development of specific hypotheses, which could be evaluated by experimental techniques at a later date. The differential personality characteristics of our typical and atypical reactors do suggest such a hypothesis. As described, the atypical responses were most frequent in the least balanced persons. It is not unreasonable to assume that such a personality structure, already inadequate to deal with everyday stresses, fraught with impulsivity and anxiety, and fearing loss of control, may be alarmed by the surge of stimulation and energy associated with amphetamine, which would but add to the tension and further threaten precarious controls. A well-balanced personality structure, on the other hand, could conceivably integrate such stimulation into ongoing activity without disturbance and with pleasant affect. The sedative effect experienced after amphetamine by a few of our subjects could be a secondary defensive reaction of the specific personalities, previously described, to handle the threatening stimulation, and may thus have been more of a withdrawal reaction than a sleep process.

In like manner the usual effects of opiates (blunting of reactivity, reduction of urgency to action, interference with associational activity, and lassitude) may constitute a pleasant relief and temporary cessation of tension and struggle for the unbalanced personality. To the balanced personality these same effects may well constitute a useless, confusing, unwanted, and unpleasant interference with normal functioning.

The differential affective reaction of the two personality groups to pentobarbital may be explained similarly. Although both pentobarbital and the opiates sedate, they differ in that the opiates may not cloud consciousness or threaten its loss through sleep. In addition, there are other effects of morphine (reduction of anxiety, e. g.) that appear to differ quantitatively from those of pentobarbital. While sleep is ordinarily accepted with pleasant affect, an anxious or wary person may experience this trend with concern if he thinks the circumstances inappropriate or unusual. Our experimental situation was presumably not an anxiety-arousing one, but the threat of impaired alertness or consciousness produced in some of our atypical subjects secondary defensive reactions and attempts at vigilance.

Explanation of atypical responses to sedative or stimulant drugs are often attributed to release or stimulation of "inhibitory centers." There are clinical observations that certain persons (particularly the aged) respond with excitement to barbiturates, and amphetamine has been used to control and quiet hyperactive children and to sedate children who were hyperactive owing to brain injuries.[14] Such reports suggest that certain persons are predisposed to atypical reactions to these drugs, whatever the mechanism. However, one must entertain the possibility that a typical reaction may occur in a given person but may provoke secondary (restitutive) reactions that are opposite in nature because of the threat involved (to the personality) in the primary drug effects. The latter view is of course similar to the one propounded for the opiates, i. e., that psychological modification of predictable drug effects primarily determined the net described response.

The fact that the bulk of the persons who reacted to placebos were also atypical in their reactions to the drugs is interesting in view of an earlier study [15] in which we reported differential personality characteristics of persons who obtained pain relief from a placebo after major operations and those who could not be thus relieved. Consistent pain relief from placebos was atypical in that study, and, while differences in age and sex preclude a detailed comparison with our present group of persons who reacted to the placebo, it is significant to observe that in both cases it is thought that personality factors played a major role in these persons' reactions to drugs. In another investigation [16] it was demonstrated how persons who react to placebos may seriously mask real differences between drugs. The present study would add atypical reactions as special difficulties of which the pharmacologist should be aware in the accurate evaluation of drug effects.

Our data may be pertinent to the problem of drug addiction. Our group with atypical reactions resembled addicts in their preference for opiates; this group was

14. Bradley, C., and Bowen, M.: Amphetamine (Benzedrine) Therapy of Children's Behavior Disorders, Am. J. Orthopsychiat. **11**: 92 (Jan.) 1941.

15. Lasagna, L.; Mosteller, F.; von Felsinger, J. M., and Beecher, H. K.: A Study of the Placebo Response, Am. J. Med. **16**: 770 (June) 1954.

16. Beecher, H. K.; Keats, A. S.; Mosteller, F., and Lasagna, L.: The Effectiveness of Oral Analgesics (Morphine, Codeine, Acetylsalicylic Acid) and the Problem of Placebo "Reactors" and "Non-reactors," J. Pharmacol. & Exper. Therap. **109**: 393 (Dec.) 1953.

made up of the more maladjusted subjects, a finding in keeping with theories as to the importance of personality deviations in the genesis of drug addiction.

The way in which the person first has contact with drugs has been emphasized as important, whether in a medical or accidental setting or an erotic, thrill-seeking setting. In earlier work we [17] have been impressed with the effect on drug reactions of the motivation of the volunteer subject, particularly when the motives are related to a desire for erotic or strange situations or sensations. While we do not imply an urge to try opiates, we suspect that trial by a person of the personality type described here, in any situation, but more particularly in a self-initiated one, is more likely to lead to a euphoric experience and desire to repeat than in persons otherwise constituted.

There has lately been a resurgence of interest in the psychology of drug action, particularly under the spur of new drugs such as *d*-lysergic acid [18] and the mental complications attendant on the use of corticotropin and cortisone.[13] The constructive development of narcoanalytic therapy and its unfortunate destructive counterpart in the "menticide" techniques of fascist and communist groups [19] belong in this field. So far, however, no study or series of studies, including our own, has made possible reliable prediction of drug reactions. Part of the difficulty here has arisen from the neglect of subjective responses to drugs by experimental pharmacologists and the tendency to nonexperimental case studies by psychiatric investigators. Relatively little attention has been given to the nature of the controls and experimental design necessary to yield reliable information in this area, although one of us [20] has recently discussed this problem.

We are in agreement with Lindemann and Clarke [13] in thinking the time opportune to organize studies of widely diverse groups, both normal and diseased, and to assess drug reactions systematically with reference to experimentally controlled psychological and environmental factors. The results of the present study emphasize the importance of the balance of mature and intellectualized control functions and affective impulsivity in the production of typical or atypical responses and present a system for experimental validation. This study is being followed up with studies of mentally disturbed patients.

SUMMARY

A group of 20 young male volunteers was evaluated with reference to typical or atypical reaction to a series of drugs (morphine, heroin, pentobarbital, amphetamine, and placebo). Differential personality dynamics, primarily in terms of the balance of mature, socially oriented controls over impulsive, egocentric emotionality, were found to be correlated with the type of drug reaction.

Massachusetts General Hospital (14) (Dr. Beecher).

17. Lasagna, L., and von Felsinger, J. M.: The Volunteer Subject in Research, Science **120**: 359 (Sept. 3) 1954.

18. Hoch, P.: Experimentally Produced Psychoses, Am. J. Psychiat. **107**: 607 (Feb.) 1951.

19. Meerloo, J.: The Crime of Menticide, Am. J. Psychiat. **107**: 594 (Feb.) 1951.

20. Beecher, H. K.: Experimental Pharmacology and Measurement of the Subjective Response, Science **116**: 157 (Aug. 15) 1952.

OBJECTIVES AND CONTENT OF POSTGRADUATE MEDICAL EDUCATION

Douglas D. Vollan, M.D., Chicago

The following article is the third in a series of eight, which together constitute the report of a two and one-half year Survey of Postgraduate Medical Education by the Council on Medical Education and Hospitals of the American Medical Association. The survey included a questionnaire study of a large random sample of practicing physicians as well as detailed analyses of the postgraduate courses offered by the numerous sponsoring institutions and organizations. The first and second articles in this series, entitled "Scope and Extent of Postgraduate Medical Education" and "The Physician as a Lifelong Student," appeared in the Feb. 26, 1955, and March 12, 1955, issues of THE JOURNAL, *pages 703 and 912 respectively.*

Postgraduate medical education is an extension of the training of a physician beyond his undergraduate and graduate years. The early years of school and hospital training provide a basis for understanding human biology as well as disease and the ways in which it can be altered or prevented. It is the purpose of postgraduate medical education to keep this basic learning fresh in the minds of physicians, to add new developments in medical science to their armamentarium, and to enlarge their knowledge in their specific fields of interest. Research is adding new knowledge and opening new fields of medicine each day. To add all of this new material to the undergraduate medical teaching program would require either an extension of the total years of training or further condensation of an already overcrowded curriculum, either one of which would be undesirable. Postgraduate medical education may be expected to assume an increasingly important role in extending the formal education of physicians. Postgraduate medical education not only should result in an increase in the physician's knowledge, but should also stimulate him to further study and possibly even research. This should give him a new sense of confidence in his relationships with his patients as well as his colleagues and enable him to render better medical care. Postgraduate medical education also strengthens the bonds between individual members of the profession as they study together, and enables medical schools to become sources of intellectual refreshment to the physician rather than distant repositories of medical science. Medical schools in turn gain through this contact with practicing physicians, whose problems and needs may then become significant influences in the constant reevaluation of the undergraduate curriculum.

An analysis of the postgraduate courses offered during the academic year 1952-1953 on the basis of their titles, content, and descriptive literature as well as information obtained during interviews with the directors of these courses made it possible to divide them into two basic types. The first is the true refresher course, designed to review basic medical knowledge and acquaint the physician with recent developments. Most physicians would

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A complete description of the sample, returns, and methods of the survey will be made available as an appendix in the reprint edition of the series to be published later this year.

benefit from work of this type. The second is the special course, designed to expand the physician's understanding of one narrow field or aspect of his own area of practice. It was found that less than 5% of the total postgraduate hours offered in the United States in 1952-1953 were of the refresher type and that the remainder were special courses (fig. 1). The relatively

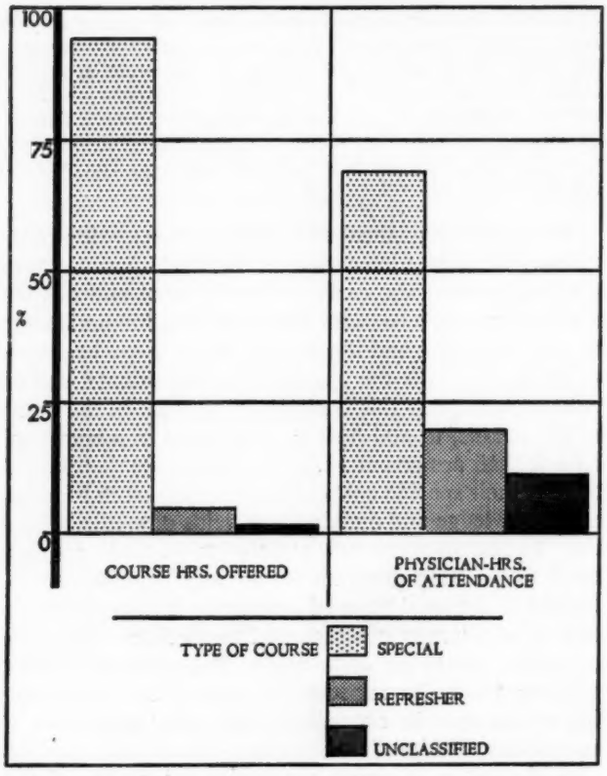

Fig. 1.—Percentage of postgraduate course hours offered and of physician-hours of attendance, by type of course, 1952-1953.

greater demand for the refresher type of course is reflected in the disproportionately high percentage (19.7%) of the total physician-hours of attendance reported for these courses.

It is further reflected by the response of the physicians in this survey to a request to list the relative importance of four factors in their own continuing education. Figure 2 shows that adding knowledge of new advances and reviewing basic medical knowledge, the two elements of refresher education, ranked first and second in importance respectively. On the other hand, expanding knowledge in one aspect of medicine or developing a part-time specialty—the objectives of special courses—were ranked lower. It is apparent that the demand for increasing postgraduate opportunities of the refresher type is much greater than is the need for more special courses.

REFRESHER COURSES

Postgraduate education of the refresher type is made up of two important components, namely, review and additive elements. The review element is concerned with recalling basic knowledge of facts and principles, especially concerning conditions that physicians do not encounter frequently in practice but must be able to recognize and treat. Review may also take the form of an occasional clinical "tune-up" to correct bad diagnostic or therapeutic habits that may creep in as a result of the pressures of practice. The additive element is concerned with bringing the physician up-to-date on new advances in medical knowledge and technique, thus narrowing the gap between medical research and practice. The distinction between these two elements of the refresher course is essential in realistic course planning, for the content and methods employed to develop each of them may vary considerably. Since the greater need is for the additive element, it is desirable that a relatively larger proportion of time be devoted to this aspect in mixed courses, although individual courses may include only one element. For example, a refresher course in general medicine may include didactic presentations of new factual knowledge as well as small-group sessions on the wards to give the physician-students opportunity to receive more personalized critiques of their own diagnostic or therapeutic techniques.

Although refresher courses are often considered to be primarily for general practitioners, the specialist too has need for periodic review. This is not to say that the same refresher courses should be used to meet the needs of both general practitioners and specialists. Such a practice generally results in unsatisfactory coverage for both groups. However, some general courses for specialists to help them keep abreast of major advances in all fields of medicine might be useful.

No refresher course, or special course for that matter, can do its task properly unless some attention is devoted to principles as well as to their practical application. Inasmuch as theoretical concepts involved in principles are not always as palatable to the physician-student as the discussion of practical techniques and factual material, the problem of interweaving the two elements requires considerable thought and effort on the part of program directors. A complete refresher program should cover the preventive, diagnostic, and therapeutic aspects of medical practice, either in a single over-all program or in separate units. Both the contraindications and indications for the use of new diagnostic methods and laboratory procedures should be emphasized. Similar careful

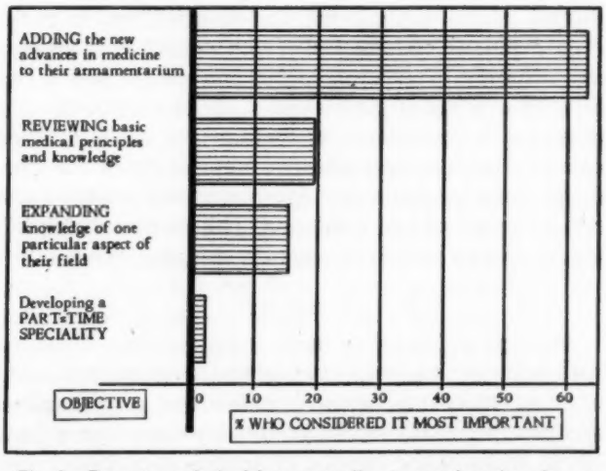

Fig. 2.—Percentage of physicians responding to questionnaire who considered various objectives to be of greatest importance in postgraduate medical education (listed in order of importance).

considerations should be given to therapeutic aspects, since the injudicious or premature use of some new therapeutic products or methods that are brought to the physician's attention through advertising or other mediums can best be avoided by clear presentation of the facts in an organized manner. Refresher courses should contain constant reminders of the fact that medicine is not only a science but also an art in which understanding human relationships is essential.

Five Levels of New Medical Knowledge.—Over-all consideration of the additive element in refresher courses has resulted in the delineation of five levels of content: (1) knowledge that is of practical everyday use in medical practice, (2) information about the new diagnostic and therapeutic services available through specialists in the region, (3) similar services available only at large medical centers, (4) information concerning experimental clinical advances not yet in common use, and (5) theoretical advances in basic medical science that may or may not have immediate practical application. It is apparent from the huge volume of medical literature that there are innumerable new developments each year that fall into one or another of these categories, but only a small portion of those would qualify as being of major significance.

The first, or practical, level is essential to every adequate refresher course, although the content may be expected to differ for general practitioners and for various specialists. From figure 3 it is evident that among those physicians answering this portion of the questionnaire over half were of the opinion that there was too little emphasis on the practical level in refresher courses. The second level, which is concerned with new diagnostic and therapeutic developments available through local specialists, is of particular importance to the general practitioner, whose resources must include the services of his nearby specialist colleagues. Although he does not need to know the details of new specialist techniques, he should know their rationale, indications, and what is to be expected of them. Most of the physicians surveyed felt that about the right amount of emphasis is being placed on this level in refresher courses.

The third level, which has to do with special services available only at large medical centers, is important to the general practitioner. For the specialist, however, it is essential to know the use and location of the new diagnostic and therapeutic facilities, such as special radiotherapy equipment, that may be too expensive or too complicated for use outside large medical centers. Very few of the physicians surveyed felt such material was being neglected in refresher courses, and many felt it was being overemphasized. This is in keeping with a very common criticism of some postgraduate instructors who spend most of the time in their courses "advertising" their wares to the physician-students assembled before them in great detail that is of little value to the student.

The fourth level includes those strictly experimental advances in clinical medicine being developed in large medical centers. The general practitioner need not be fully informed of these developments, but both he and the specialist have a legitimate interest in them. The respondents' opinion was almost equally divided as to the emphasis being placed on this aspect. The fifth level includes those strictly theoretical advances in the knowledge of human biology and basic medical science that aid in the understanding of the human being but that may not have immediate clinical significance. When these advances are fundamental to an understanding of basic medical science they should be incorporated into all refresher programs, for general practitioners as well as specialists. The chief value of this type of material is intellectual stimulation. A substantial percentage of the physicians in this study felt that this level was being given too little attention.

Content of Refresher Courses.—Refresher courses for specialists pose little if any problem as far as content is concerned, since the field in each case is circumscribed. Regional differences in disease prevalence create problems in such planning for general practitioners. Program directors have come to depend on one or more

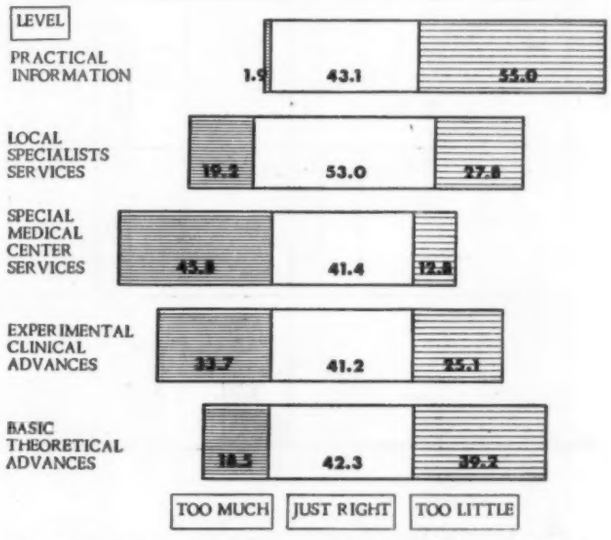

Fig. 3.—Percentage of physicians responding to questionnaire who considered the amount of emphasis being placed on the five levels of new medical knowledge in refresher courses to be too much, too little, or just right.

of three basic sources of information from which to plan the content of courses. Program planning by committee is probably the most common approach to this problem. Separate and uncoordinated planning by the individual departments of a medical school rarely result in well-rounded refresher programs for general practitioners. Committees are likely to be influenced by whether a certain subject enjoyed a large enrollment when given earlier, how often it has been offered in recent years, whether a topic is prevalent in the recent journals, the willingness or reluctance of various departments to cooperate in offering a course, and budgetary factors. Less frequently refresher course content is based on objective data from health department statistics. Because only reportable diseases and mortality figures are available from this source, it is difficult to obtain a complete or well-rounded knowledge of the refresher needs of physicians in any given region. It is hoped that the current interest in morbidity studies will result in broader understanding

of the extent of medical problems, understanding that can then be used to help in the planning of comprehensive refresher programs.

There is an increasing tendency on the part of schools and organizations engaged in postgraduate education to seek answers to this problem by canvassing practicing physicians. This is most useful when carried out in a systematic fashion by a questionnaire or interview technique. Because of the fact that content needs vary in different regions no attempt was made to study this aspect of the problem in detail. Physicians were asked to indicate the relative need—great, moderate, or little—for refresher training relating to the various body systems and subjects. The most significant finding from this part of the study was that the total score for each of these showed relatively little variation, indicating that the needs for refresher education are not heavily

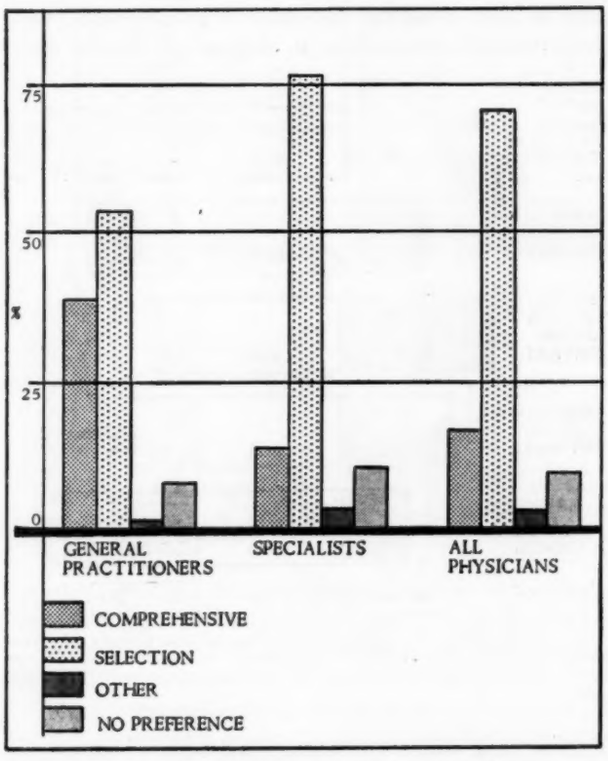

Fig. 4.—Percentage of physicians responding to questionnaire who preferred to receive their refresher training by a comprehensive program or by selection from among the various courses offered. Specialists include part-time as well as full-time specialists.

weighted for any particular system or subject. The cardiovascular, endocrine, psychological (i. e., psychiatric and psychosomatic), digestive, and metabolic areas of study headed the list, with some variations for general practitioners taken as a separate group (see table 1).

To be most effective, refresher course planning should be based upon an objective study of all of the data that can shed light on the problems in a given area, both from available morbidity statistics and physician canvasses, leaving it to the medical faculties to decide what details should be presented on each of the general topics so determined.

Long-Term Refresher Course Planning.—The problem of what material to include in general refresher courses is largely dependent on the period of medical progress to be covered. It is obvious that a week's refresher course for general practitioners could not deal adequately with the advances during the past five years in all major fields of medicine. However, a week might suffice to cover one field such as obstetrics or psychiatry, or a week might suffice for all fields if the period to be covered were one year instead of five. An extreme example of the refresher course is what might be termed the "retraining" program, in the form of a long (six to nine month) course in all fields designed to refresh the physician who has been away from clinical medicine for a long time, such as men in the armed forces or graduates of foreign medical schools seeking licensure in this country.

Although most institutions employ no over-all plan for their postgraduate courses, there is a tendency for those with long experience in this field to develop a master design for coverage of all basic areas of medicine every four or five years. Most frequently the subject matter is divided into the five broad fields of clinical medicine—surgery, internal medicine, pediatrics, obstetrics, and psychiatry—but no single pattern has emerged to date that warrants a plea for universal application. Physicians were asked to indicate their preference either for a comprehensive program designed to systematically cover all of their field over a given period or for selecting courses from among many offerings to meet their own individual needs. About 70% preferred the selection or à la carte method, and about 20% preferred the comprehensive or table d'hôte method (fig. 4). Interest in the comprehensive approach however, was almost twice as high for general practitioners taken separately as for the group as a whole.

TABLE 1.—*Body Systems and Subjects Ranked by Physicians, by Need for Postgraduate Courses*

Systems and Subjects	All Physicians	General Practitioners
Cardiovascular	1	1
Endocrine	2	3
Psychological	3	4
Digestive	4	2
Metabolic	5	10
Blood	6	8
Nervous system	7	9
Female genital	8	6
Respiratory	9	11
Urinary	10	12
Skin	11	5
Musculoskeletal	12	14
Pediatrics	13	7
Obstetrics	14	13
Eye and ear	15	16
Male genital	16	15
Other	17	17

Whether the comprehensive or selective approach is used by the individual physician, institutions engaged in postgraduate education would undoubtedly strengthen their programs by using a master plan. Where several institutions have postgraduate programs in the same area, the burden of total coverage could be shared between them by a system of coordination that utilized the strong departments of each institution to the best advantage. Institutions with serious long-range plans for postgradu-

ate education should draw up a definite, systematic blueprint, taking into consideration the group for whom the courses are designed, the total time span during which the fields are to be covered, and the amount of time to be devoted to each subject in the field. Such organized planning will help institutions budget faculty time and resources and aid individual physicians in mapping out long-term postgraduate study schedules that they may desire to follow. It is conceivable that in the future some medical schools will purposely design their undergraduate curriculums to be supplemented by formal return sessions of their graduates for annual refresher training.

SPECIAL POSTGRADUATE COURSES

The second basic type of postgraduate education is exemplified by the special course, which is designed to expand or enlarge the physician's knowledge and understanding of one particular field or subject in medicine. Such courses generally bear the name of a specialty such as surgery or a subject such as carcinoma of the alimentary system. The variety of terminology used in the labeling of special courses often leads to considerable confusion as to the real content.

Before proceeding to a discussion of the characteristics and specific content of special courses, there are certain types of courses that need special mention. The so-called cram-course, designed to help residents prepare for specialty board examinations outside their formal residency programs is more graduate than postgraduate, though often included in the latter category. The same can be said for long-term academic programs in the subspecialties that have been accepted by the appropriate boards as equivalent to residency training, even though an occasional physician may use such courses for postgraduate purposes. Long-term training programs in fields that do not as yet enjoy board-specialty status but are being taught as a specialty, such as psychoanalysis, have traditionally been listed among postgraduate courses, despite their frankly graduate nature.[1]

Basic science courses designed as a part of an over-all specialty training program are understood to be graduate courses and hence outside of the scope of this report, but basic science courses for practicing physicians are offered in a number of institutions. The experience of most postgraduate directors, however, is that practicing physicians are not interested in basic science courses per se but prefer this material to be thoroughly integrated with the practical aspects of a clinical subject. Many medical schools and larger hospitals have elaborate basic science programs for residents as regular departmental activities to which practicing physicians in the area are invited, with few attending in most cases. Some schools allow physicians to take all or part of the undergraduate medical course in one of the basic sciences, or attend special summer basic science review courses. Most of these attempts to combine graduate or undergraduate teaching with postgraduate teaching have had very limited success.

The same principles of course planning relating to content mentioned earlier in connection with refresher courses apply to a large degree to special courses, although fluctuations in subject demand make long-term planning less feasible than with refresher courses. Most educators who have had a great deal of experience with special courses are inclined to develop a series of graded courses in a particular field or subject, through which the physician-student can progress from year to year, thereby avoiding duplication of material. The quality of special postgraduate courses as well as their attractiveness to physicians would be much enhanced if individual schools concentrated their special courses on a limited number of definite fields and effected continuity through the use of the same faculty group for each course in a graded series. By dividing the fields a number of schools in a single region could easily cover all of the special postgraduate needs in the area.

Content of Special Courses.—Figure 2 shows that expanding knowledge in one aspect of their own field was the most important postgraduate need among only 15.1% of the physicians responding to the questionnaire, but

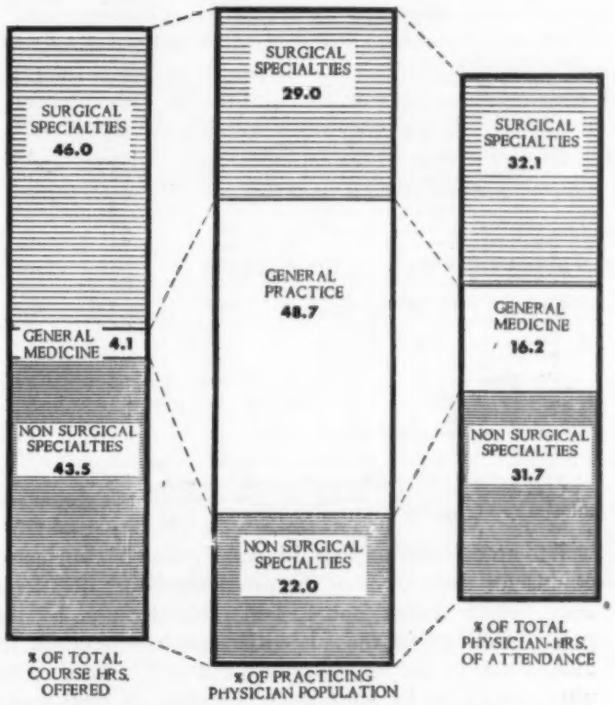

Fig. 5.—Percentage of total course hours offered and physician-hours of attendance at postgraduate courses in the United States, 1952-1953, related to distribution of practicing physician population, by field of practice (basic science course hours and attendance not included).

three-fourths of the group indicated some need of this kind. A physician may take special courses for a number of reasons. Probably the most important arises from the recognition that his practice has become heavily weighted in one particular field, such as traumatic surgery if he is in an industrial area or geriatric problems if he is in a region that attracts retired persons. Others may wish to acquire knowledge in entirely new fields of medicine that are not yet considered specialties but that may require protracted periods of study. The judicious use of radioisotopes, for example, can best be assured by a period of formal study. Still others take special courses simply to satisfy their intellectual curiosity. The titles and the content of many special courses, particularly in surgery, have raised doubts in the minds of many medical educators, who feel that surgical technique should only

1. Vollan, D. D.: Scope and Extent of Postgraduate Medical Education in the United States, J. A. M. A. **157**: 703 (Feb. 26) 1955.

be taught to surgical specialists. Many, however, take the position that limited surgical training for general practitioners will help them "do better what they are already doing," so long as such training is not used as a short-cut to specialty practice.

In figure 5 it is shown that an overwhelming majority of postgraduate courses offered are in special fields or specialty subjects. Only a small fraction of the opportunities (4.1%) are primarily and specifically in the field of general medicine, i. e., for general practitioners. It is well to note, however, that this small group of courses accounts for over 16% of the physician-hours of attendance, which indicates a considerable demand by this group. Courses in the surgical specialties account for almost half of the opportunities, but only a third of the physician-hours of attendance. Courses in nonsurgical specialty subjects, which make up over 40% of the opportunities, account for only about a third of the attendance. In addition to courses in general medicine the attendance percentage exceeds the offering percentage in the case of only a few specialties: ophthalmology, otolaryngology, urology, and neuropsychiatry (table 2).

TABLE 2.—*Percentage of Total Course Hours Offered and Physician-Hours of Attendance for All United States Postgraduate Courses Related to Physician Population, by Field of Practice, 1952-1953**

Field	Total Course Hours Offered	Physician-Hours Attendance	Practicing Physician Population
Total	100.0	100.0	100.0
General medicine	4.1	16.2	48.7
Surgical specialties †	46.0	32.1	29.0
Anesthesiology	14.3	3.5	1.1
Neurosurgery	.....	.....	0.2
Obstetrics and gynecology	9.3	2.8	6.2
Ophthalmology	4.5	9.6	3.3
Orthopedics	0.5	0.2	1.4
Otolaryngology	4.8	6.0	3.0
Plastic surgery	.....	.....	0.2
Proctology	0.4	0.1	0.5
General surgery	10.2	7.5	11.5
Thoracic surgery	0.2	0.2	.....
Urology	1.6	2.2	1.6
Nonsurgical specialties †	43.5	31.7	22.0
Dermatology	2.4	0.4	1.2
Internal medicine	24.0	19.0	8.9
Pathology	2.0	1.1	1.1
Pediatrics	3.9	2.2	3.8
Physical medicine	0.5	0.5	0.1
Public health	2.3	0.9	2.2
Psychiatry and neurology	4.5	6.3	2.7
Radiology	3.9	1.3	2.0

* Basic science and miscellaneous courses omitted.
† Specialists in each field include full-time specialists plus general practitioners giving special attention to the field.

When compared to the distribution of the total practicing physician population the differences are even more striking. Most significant is the fact that less than 5% of the hours offered are specifically designed for general practitioners, who make up almost half of the potential consumers of postgraduate education. The disparity would be even more marked if those general practitioners giving special attention to a specialty (part-time specialists) had not been included in the specialty classifications. It is probable that many of the courses in the specialty categories are used by general practitioners. Both surgical and nonsurgical specialties enjoy a percentage of opportunities approximately double the percentage of the physician population they represent. Anesthesia had the greatest ratio of opportunities to physicians in the group, while neurosurgery had the lowest. Most large fields are well covered, and subjects such as allergy, hematology, cardiology, and oncology are particularly well covered. A field of unusual recent interest has been psychosomatic medicine, which seems to be replacing much of the earlier emphasis on psychiatry. Aspects of public health have been covered by well-organized programs in special subjects such as industrial medicine, communicable disease, poliomyelitis, and radiological health. Most individuals who have had experience with courses in public health and preventive medicine would prefer to see the principles of these fields incorporated with other material rather than taught as an isolated course.

Because of the large amount of money available through health departments and voluntary health agencies there have developed a great many courses in a specific disease group or category such as heart disease, tuberculosis, poliomyelitis, cancer, or mental health, which have often resulted in satiating the appetite for these subjects. The interests of groups offering such assistance would be better served if their subjects could be included as components of more comprehensive programs.

Beyond the clinical fields of medicine there are also postgraduate opportunities in forensic medicine, hospital administration, medical economics, and medical history. Supplying organized information to physicians on extramedical aspects of practice may be considered a subsidiary function of postgraduate medical education.

Developing Part-Time Specialists.—It has been shown that over 15% of practicing physicians are general practitioners who give special attention to a specialty in their practice.[2] The further development of such part-time specialists has been advocated by those who maintain that there are regions that cannot support fully qualified specialists in some fields, particularly in rural areas. In such areas it is not uncommon for one of the general practitioners to obtain some training in anesthesiology or roentgenology, for example, so that he may assume such responsibilities when they arise in an emergency. No one has suggested that special postgraduate courses in such fields replace formal graduate training, but until enough specialists are available, it is one way to afford isolated communities at least part-time specialist service.

TABLE 3.—*Percentage of 343 Physicians Specifying a Desire for Postgraduate Work in Form of Part-Time Specialty Training*

Field	%
Total	100.0
Surgery	24.9
Internal medicine	13.9
Obstetrics and gynecology	12.5
Cardiovascular diseases	8.2
Pediatrics	7.4
Anesthesiology	5.9
Eye, ear, nose, and throat	4.2
Dermatology	3.4
Urology	3.4
Allergy	2.3
Proctology	2.3
Radiology	2.3
Pulmonary disease	2.0
Public health and industrial medicine	1.7
Orthopedic surgery	1.4
Physical medicine and rehabilitation	0.6
Thoracic surgery	0.6
Gastroenterology	0.3

Only 1.7% of the physicians responding to the questionnaire considered the development of a part-time spe-

2. Vollan, D. D.: The Physician as a Lifelong Student, J. A. M. A. 157: 912 (March 12) 1955.

cialty to be their greatest postgraduate need (fig. 2), and an additional 40% expressed their desire for some work of this kind. Among general practitioners and part-time specialists taken together there was a demand for part-time specialty training in all of the board-specialty fields except neurological surgery, plastic surgery, and pathology (table 3). As might be expected, surgery led the list, accounting for a quarter of the total. Internal medicine was next, followed by obstetrics and gynecology, cardiovascular diseases, and pediatrics. Almost 6% of the physicians desiring part-time specialty work mentioned anesthesiology, this being one of the few fields in which such courses are specifically arranged.

Whatever the pros and cons of this type of training may be there seems to be a substantial need for it. For example, many years ago short (six to eight week) courses were used to train practicing physicians to do public health work on a part-time basis. This was discontinued some years later because it was believed to run counter to the movement toward full-time graduate training programs in schools of public health. However, it is significant to note that several health departments have recently reintroduced shorter training programs for part-time health officers. It may well be that the development of a very narrow subspecialty by each of a number of general practitioners in towns in rural areas could substitute for a full specialist in the broad field of which these subspecialties constitute parts. This system would appeal to the desire to excel in one limited area of learning and could result in raising the level of general practice.

COMMENT

Postgraduate medical education must be looked upon as an extension of the undergraduate and graduate years of medical training if its full potential is to be realized. Whereas the physician receives his basic understanding of principles in his student, intern, and resident years, much of the increasing volume of factual medical information should be made available to him through formal postgraduate education. Any attempt to standardize the content of postgraduate courses would be unwarranted at this time, but the future of postgraduate education depends in large measure upon the degree to which sponsoring institutions clearly define the objectives of their programs and design courses to meet specific needs.

Of the two basic types of postgraduate courses the special type, designed to expand the physician's knowledge of a limited field or subject, accounts for the overwhelming majority now given. But the greatest postgraduate need is for the refresher type, designed to review the physician's own field and add to his knowledge of new developments within it. Probably the greatest single need in postgraduate education is for an increase in well-organized refresher courses for general practitioners. The content of refresher programs should be based upon systematic appraisal of the specific needs of physicians within a region, through analyses of available statistical data, consultations among medical school faculties, and a well-designed canvass of the physicians practicing within the region. Although principles should be emphasized in refresher courses, their reception by the physician-student will be greatly enhanced by integrating them with material that is of immediate practical value. Not only should the general practitioner be instructed in new developments pertinent to his own practice, but he should be made aware of advances in the specialties that will encourage an extension of his use of specialist services for his patients. Although refresher courses may be enriched by introducing new additions to theoretical biological and basic scientific knowledge, undue emphasis on such material can only result in discouraging the physicians in greatest need of continuing medical education.

Sound postgraduate education requires long-term planning by the sponsoring institutions. This includes blueprinting the over-all needs of the physicians in the area and working out an integrated program through which all of the subject needs are covered during a definite period of time. Thus it will be possible for physicians to organize their own schedules in order to include a system of refresher education as a part of their regular professional life, whether by selecting from among the available postgraduate courses or by joining a comprehensive plan designed to cover all aspects of their field over a given period of time. Special courses, which at present dominate the picture, are still needed in many fields. Special adaptation of such courses for part-time specialty training is desirable to a limited degree in certain fields.

COUNCIL ON FOODS AND NUTRITION

The following announcement has been authorized by the Council on Foods and Nutrition.

JAMES R. WILSON, M.D., *Secretary.*

A Symposium on "Some Inorganic Elements in Human Nutrition," jointly sponsored by the Nashville Academy of Medicine; the School of Medicine, Vanderbilt University; and the Council on Foods and Nutrition, will be held at Nashville, Tenn., 9:30 a. m., Monday, April 4, 1955. The following program has been arranged, and the meeting will be open to all interested persons.

1. *Iodine Metabolism in Endemic Goiter*
   Edwin B. Astwood, Tufts College Medical School, Boston
   Discussant, B. T. Towery, Vanderbilt University, Nashville, Tenn.
2. *Copper Metabolism in the Human*
   Kelly H. Gubler, University of Utah, Salt Lake City
   Discussant, James Baxter, National Institutes of Health, Bethesda, Md.
3. *Iron Metabolism and Requirements of the Human*
   Carl V. Moore, Washington University, St. Louis
   Discussant, William J. Darby, Vanderbilt University, Nashville, Tenn.
4. *Zinc Metabolism and Requirements of Man*
   B. L. Vallee, Peter Bent Brigham Hospital, Boston
   Discussant, C. A. Elvehjem, University of Wisconsin, Madison, Wis.
5. *Magnesium Deficiency Syndrome in Man*
   Edmund B. Flink, Veteran's Hospital, Minneapolis
   Discussant, L. A. Maynard, Cornell University, Ithaca, N. Y.
6. *Potassium Deficiency in the Infant*
   Daniel C. Darrow, Children's Mercy Hospital, Kansas City, Mo.
   Discussant, Calvin W. Woodruff, Vanderbilt University, Nashville, Tenn.

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OBESITY

Obesity is generally recognized as a serious health hazard. As a result commercial organizations have exploited the public with senseless and even dangerous reducing processes. Obese persons have often encouraged this exploitation, because when such a person decides to reduce he is apt to reject the rational, slow method in favor of the quick, spectacular way.[1] The older theories that attributed obesity to an endocrine disturbance have been shown to be erroneous. In most cases overweight is not the result of any organic disease.[2] Although the idea that obesity may be voluntarily controlled by reduction in caloric intake is implicit in many popular articles and advertisements and is held by many physicians, as more light is being shed on the problem this theory appears to be an oversimplification at best.

If an obese person is allowed to eat all the food he wants he will not gain but will maintain himself at a certain level. This is because although he eats more than enough to supply his physiological needs he is under a compulsion to satisfy his psychologically controlled appetite. Until this appetite is satisfied he honestly believes he has eaten very little—"like a bird" as he may put it—although the amount of food consumed may be gargantuan. It is now believed, therefore, that some central nervous system control, as yet not well understood, determines the average body weight of most adults. Reducing the capacity of the stomach by removing part of it surgically only makes the fat man eat oftener so that his daily caloric intake shows no appreciable change. Because all overweight persons are not overweight for the same reason it is necessary to find the cause before attempting to plan a therapeutic regimen. Obesity in young persons of pyknic habitus may be observed at puberty and disappear toward the end of this physiological period. Strong expressions of social disapproval of their overweight, especially toward girls in this category, may give rise to an emotional maladjustment that perpetuates their obesity.[1]

In addition to age and body build, familial eating habits must be taken into consideration as well as the cultural attitudes of certain nationality groups to body size and obesity. A sudden decrease in activity may result in a gain in weight. Some persons who have suddenly given up smoking for one reason or another find themselves putting on weight. An inflammatory or neoplastic disease in the appetite-regulating center in the hypothalamus is a cause of obesity in rare instances. By far the commonest cause, however, appears to be emotional conflict. In this category too there may be a variety of causes. Persons with a feeling of anxiety or inferiority may yearn for greatness, and their overeating may give them added weight that they subconsciously equate with importance. Some of them believe that they can reduce their weight any time. This feeling gives them a sense of power that they will not give up by putting it to the test.[1] Others seek gratification in self-indulgence to make up for some lack. Their attitude may be that if life is not good to them they will be good to themselves. In others overeating may express an inner hostility or defiance of a disapproving society.[2] Whatever the cause, restricting the intake of food does not alter the urge to eat.

A person who wishes to reduce is faced with serious obstacles. At every social gathering he is offered fattening tidbits. If he eats with his family a superabundance of food is placed before him at every meal. A person who has reduced his caloric intake and has lost a few pounds may have an increased feeling of well-being, but, as he continues his efforts to reduce, an uncontrollable hunger sets in so that he becomes obsessed with thoughts of food in much the same way as have prisoners of war who were kept for a long period on a submaintenance diet. Such a patient's endurance rarely lasts longer than three or four weeks, because the loss of weight is accomplished at the expense of the patient's feeling of security.

No drug has yet been discovered that will safely and effectively control the appetite, but that one may yet appear is certainly possible. Although a predictable loss of weight can be produced in any obese person by giving a low caloric diet under strict supervision, the problem of how to maintain the loss is still with us. This fact is never mentioned in reports of success with various reducing fads. Follow-up studies have proved very disappointing.[3] According to Conrad,[2] group psychotherapy has shown some promise, and Brosin [4] states that social clubs organized along lines similar to those of Alcoholics Anonymous may give the patient the emotional support he needs and may succeed where other methods have failed, but others have reluctantly concluded that it is easier to make a fat man happy by means of psychotherapy than to make him thin. Reducing is at best a long, hard process fraught with frustration, failure, mental torture, and painful hunger contractions. It is unsafe to generalize, and every patient must be evaluated in terms of his body build and emotional history. Before undertaking a course of treatment it is wise to find out why the patient wants to reduce, what he really wants out of life, and of what he is afraid.[4]

1. Bruch, H.: Psychological Aspects of Reducing, Psychosom. Med. **14**: 337-346 (Sept.-Oct.) 1952.
2. Conrad, S. W.: The Psychologic Implications of Overeating, Psychiatric Quart. **28**: 211-224 (April) 1954.
3. Bowser, L. J.; Trulson, M. F.; Bruleny, R. C., and Stare, F. J.: Methods of Reducing: Group Therapy vs. Individual Clinic Interview, J. Am. Dietet. A. **29**: 1193-1203 (Dec.) 1953.
4. Brosin, H. W.: The Psychiatric Aspects of Obesity, report to Council on Foods and Nutrition, J. A. M. A. **155**: 1238-1239 (July 31) 1954.

CONTROL OF GOUT

Twenty years ago gout was referred to as the forgotten disease. Now that it is better understood it is readily recognized even in the absence of tophi, and current progress in its treatment is encouraging. Gutman and Yü (this issue, page 1096) point out that effective treatment is no longer limited to the recurring attacks and that the patient need no longer look forward to a progressive increase in the frequency and severity of the attacks. Although both the acute arthritic and the chronic tophaceous phases are somehow due to faulty purine metabolism, only the chronic phase can be shown to be the direct result of deposits of uric acid in the tissues. Some uric acid is synthesized in normal persons regardless of the type of food eaten, but this synthesis is greatly accelerated in gouty patients. Uric acid is also abundantly formed from foods high in purines or in nucleic acid.

It has become increasingly evident that the management of the two phases requires entirely different therapeutic approaches and that both may now be controlled. Like the control of diabetes mellitus, this control requires attention to the diet combined with maintenance doses of drugs that will inhibit the acute exacerbations and drugs that will keep the serum levels of uric acid within normal limits, or less than 6 mg. per 100 cc. Colchicine, phenylbutazone, and corticotropin relieve the acute attacks of gouty arthritis but have no effect on uric acid metabolism. The mechanism of their action remains unknown, and, of these, colchicine is still the drug of choice in most cases. After the acute attack subsides, daily maintenance doses are required. Patients who discontinue use of this drug after a long period of taking it promptly have a recurrence of acute symptoms even though they may still be taking urate eliminants.

Gutman and Yü point out that control of the chronic phase is necessary in only about 50% of patients with gout: those who show surface or roentgenographic evidence of tophi formation or who have persistent swelling and stiffness in their joints. Until recently no means of effective and sustained control of the slow progress of the tophaceous phase in those afflicted with this form of gout was available. As is the case with diabetes, dietary restriction, although necessary, is not enough. A urate eliminant is required. Ideally such an agent must not allow elimination of essential metabolites along with the urates and must be nontoxic because, like insulin, it must be given daily over a period of many years. Such urate eliminants as cinchophen and the salicylates are not active enough to restore normal levels of uric acid in the serum. The usefulness of cinchophen is further limited by its toxicity. Probenecid, however, is relatively nontoxic, and recent reports [1] indicate that it effectively inhibits the reabsorption of urates by the renal tubules. It does not relieve the painful acute exacerbations. Although early in the course of treatment with probenecid the drug may even precipitate an acute flare-up, probenecid treatment should be continued without interruption.[1a]

Bartels [1b] has followed 42 patients with gout who, having failed to respond to other forms of treatment, were given probenecid for 12 to 30 months. Treatment failures were observed in only three. The serum uric acid in these patients dropped to normal in three to six weeks. The daily maintenance dose must be adjusted individually to each patient and may vary from 0.25 to 3 gm. Such patients should be given a high daily fluid intake, and the urine should be kept alkaline. A serum uric acid level of less than 6 mg. per 100 cc. is considered a sign of adequate control. Smyth [1c] reported that probenecid prevents the formation of further tophi in patients with tophaceous gout and may even reduce those already formed. Salicylates should not be given to patients receiving probenecid because they neutralize the urate eliminant action of the latter. It is generally agreed that, although uric acid is readily synthesized from the simplest nitrogen and carbon compounds, foods rich in purines or nucleic acid should be avoided by gouty patients because such a diet greatly increases uric acid production. A high fat diet should also be avoided because it favors uric acid retention. Like the chemotherapeutic control, dietary control must be modified to meet the requirements of the individual patient. After the patient has been observed on a restricted diet, the amount of muscular cuts of meat in the diet can be gradually increased within the patient's tolerance.

Prolonged control through maintaining a negative uric acid balance becomes clinically evident through (1) failure of new tophi to appear, (2) decreased swelling and stiffness of the involved joints, and (3) a slow but definite reduction in the size of existing tophaceous deposits. In most patients this type of control obviates the need for surgical drainage and amputation and affords another example of the progress from palliative to preventive medical treatment.

PAPERS FOR THE BOSTON CLINICAL MEETING

Abstracts of papers to be offered for presentation at the Boston Clinical Meeting of the American Medical Association, Nov. 29-Dec. 2, 1955, must be submitted in duplicate before July 15. All who desire to appear on the program should submit their abstracts as early as possible. Abstracts must be limited to a 300-word summary including important data and conclusions; charts and tables may be attached to aid in the selection of papers by the program committee. Subjects for presentation may include clinical or scientific aspects of all branches of medicine and surgery, but they must be original contributions that have not been presented or published previously. The time allotted for the papers at the Clinical Meeting will be limited to 20 minutes including lantern slides. Papers will be selected on a competitive basis from among the abstracts, and authors will be notified by September 15 whether or not their papers are accepted. The general chairman of the Clinical Meeting is Dr. Frank P. Foster, American Medical Association Clinical Meeting, Mechanics Hall, Boston. The chairman of the program committee is Dr. Theodore L. Badger, 22 Fenway, Boston 15.

1. (*a*). Robson, H. N.: Gout, M. J. Australia **1**: 792-793 (May 22) 1954. (*b*) Bartels, E. C.: Gout—Now Amenable to Control, Ann. Int. Med. **42**: 1-10 (Jan.) 1955. (*c*) Smyth, C. J.: Current Therapy of Gout, J. A. M. A. **152**: 1106-1109 (July 18) 1953.

THE PRESIDENT'S PAGE

A MONTHLY MESSAGE

Among the more difficult questions coming before the present Congress is that of devising a satisfactory program for the medical care of dependents of service personnel. One of our firmly held tenets has long been that the individual is primarily responsible for his own health and that of his family and that only when he is not able to carry out this responsibility should other agencies be brought into play. It can be said fairly that, when a man with dependents is drafted into the armed forces, his ability to meet this obligation is interfered with. The problem is how this situation can best be met. Practical considerations are those of cost, convenience of access, and quality of service, but perhaps most important is how it can be accomplished in a way that will conserve our total medical resources. Careful consideration should also be given to the relative obligation of the government to individuals on the basis of short-time or long-time service. Career personnel have no real ties with any community and naturally look to the national government for assistance in providing medical care for their dependents.

It is axiomatic that the primary mission of the armed forces medical department is to support and help maintain an effective fighting force for the defense of our country in time of war. The primary mission of civilian medicine is to constantly improve the quality of medicine, to expand its quantity, and to make it more readily available to all of the people. To accomplish all of these objectives there must be a wise division of our total medical resources between these two great segments of medicine. To rob the one and overexpand the other is a harmful policy. If major hostilities should develop, a greatly expanded medical service for the armed forces will be required. They can effectively augment their strength only from a virile and effective civilian medical population.

Maldistribution of skilled personnel, facilities, and patients does not serve the common good. Overexpansion of service hospitals in time of peace and undue dislocation of professional and technical personnel or of patients is wasteful, just as undue restrictions on the real needs of the armed forces will interfere with the proper accomplishment of their mission.

The present system of providing care for dependents is haphazard and unfair, since the availability of such care is now on the basis of chance proximity to a service institution. It is also unfair in that it does not recognize the greater obligation of the government to the long-term service and career personnel. It is recognized that in foreign stations, and in certain areas in the United States where adequate civilian facilities do not exist, the burden of dependent care must fall largely on the service hospitals. In other areas, remote from such hospitals, the bulk of the work must be done by civilian medical personnel and in civilian hospitals. Where both types of facilities exist, freedom of choice by the dependent as to where medical care is sought would depend on local conditions and other factors.

There seems no justification for drawing dependents of service personnel into military hospitals for the purpose of maintaining specialty training programs. The training of specialists can on the whole be better accomplished in civilian teaching hospitals. A voluntary system of insurance, jointly financed by the individual and the government, has been proposed, with payroll deductions for those individuals who choose to participate. This plan should contain a clear definition of dependency and should allow freedom of choice by the dependents as to whether they seek care in an armed forces or a civilian facility. Recognition of length of service could be accomplished by increasing the benefits and the government's share in the cost in proportion to the length of service. Such a program would not detract materially from the benefits now available to a portion of the dependents but would make these, or equivalent benefits, available to all. This plan would result in a more even distribution of civilian patients as between service and civilian hospitals, stabilize the intake, decrease the cost for the armed forces, and support the economy of the civilian hospital system. It would lessen the dislocation of both patients and professional and technical personnel and would conserve our total medical resources.

The government hospitals in the continental United States are at present in competition with civilian hospitals in many areas. The federal government, in conjunction with states and localities, is spending millions of dollars under the Hospital Survey and Construction Act in civilian hospital construction. And yet, at the same time, this government is making it more difficult for some of these civilian hospitals to operate at a more reasonable cost. Much of the patient load that would normally flow into these hospitals is diverted from community enterprises into government-supported hospitals. This does not make sense from the standpoint of producing good medical care for the American people as a whole. It has resulted in the wasteful duplication of hospital facilities, unwarranted dispersion of needed personnel, and an increased cost of hospital care for those who pay their way. The present policy is producing a centripetal force that is drawing more and more patients and more physicians and other health personnel into the federal vortex.

The only justification for participation of the federal government in a plan for providing medical care for service dependents is to equalize the ability of individuals to provide such care for their families, as between those who are members of our defense forces and those who remain on a civilian status. Any plan devised in this field should not go beyond this purpose.

WALTER B. MARTIN, M.D., Norfolk, Va.

ORGANIZATION SECTION

CLINICAL MEETING, NOV. 29, 30, DEC. 1, 2, 1955, MECHANICS HALL, BOSTON

Abstracts

1) Abstracts of papers to be offered for presentation at the Clinical Session of the American Medical Association must be submitted in *duplicate* before July 15, 1955, with an absolute deadline of Aug. 1, 1955. They should be sent to Dr. Theodore L. Badger, Chairman of the Program Committee, Care of the Massachusetts Medical Society, 22 Fenway, Boston 15, Mass.

2) Titles of papers alone will not be considered by the Program Committee, and abstracts of subjects for presentation must be presented as described below.

3) Abstracts must be limited to a 300-word summary including important data and conclusions. Charts and tables may be attached to aid in the selection of papers.

4) All abstracts and papers will be reviewed by the Program Committee and, when necessary, by experts in special fields in order to select those containing the most suitable material. *Final selection will be on a competitive basis.*

5) Subjects for presentation at the meetings may include clinical and scientific aspects of all branches of medicine and surgery, as well as the results of investigative work bearing on these subjects.

6) The names, titles, including hospital affiliations, and complete addresses of all authors must accompany each abstract. The author who is to present the paper must be the first author listed in the abstract.

7) Those wishing to present subjects of a confidential nature from the armed forces or other sources must clear the material through official channels *before* submitting the abstracts to the Chairman of the Program Committee.

8) It is urged that all who desire a place on the program of the Clinical Session submit their abstracts as early as possible in order to facilitate the work of the Program Committee in competitive selection of papers. The deadline, however, must be met in order to get the program ready. Remember the deadline is July 15, 1955.

Papers

1) Subsequent to review of the abstracts by the Program Committee, papers will be selected on a strictly competitive basis from among the abstracts for presentation at the Clinical Session. Authors will be notified by Sept. 15, 1955, whether or not their papers are accepted for presentation.

2) Papers presented at the Clinical Session must be original contributions which have not been previously presented or published. All such papers should be considered as belonging exclusively to the American Medical Association and should not be submitted for publication elsewhere without the advance permission of the American Medical Association.

3) The time allotted for presentation of papers at the Clinical Session in November will be strictly limited by the committee to 20 minutes, including lantern slides, in order to permit 5 minutes of discussion following the paper.

FRANK P. FOSTER, M.D.
General Chairman

THEODORE L. BADGER, M.D.
Chairman
Program Committee

SECOND PAMPHLET ON SEX EDUCATION

"A Story About You" is the name of the second pamphlet in the new sex education series prepared by the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association. This pamphlet is now off the press, and three more in this series are in production. These pamphlets are being distributed by both the previously named associations.

ANNUAL MEETING IN ATLANTIC CITY

At the Annual Meeting of the American Medical Association, June 6-10 in Atlantic City, N. J., physicians will find ample opportunity for catching up on the latest discoveries in medicine in the nearly five full days of lectures, scientific and technical exhibits, and color television and motion picture presentations. The convention will center its activities in the Atlantic City Auditorium and adjacent hotels. Headquarters will be at the Traymore hotel, where the House of Delegates will convene.

Outstanding scientific features will include: a report on the Salk poliomyelitis vaccine at a meeting of the sections on pediatrics and preventive medicine; a general discussion of resuscitation of the newborn infant for the sections on anesthesiology, diseases of the chest, general practice, obstetrics, and pediatrics; exhibit-symposiums on rheumatism and diabetes; fracture and fresh pathology exhibits; and a new "Queries and Minor Notes" feature in which consultants from all branches of medicine will be on hand to answer physicians' questions concerning specific cases. In addition, the Air Force will demonstrate its "flying infirmary" on the beach in front of the auditorium throughout the week. More than 325 scientific exhibits and 350 technical exhibits will be on display. The color television program will present surgical and clinical demonstrations piped directly into the auditorium from Philadelphia hospitals. The auditorium will be open exclusively for physicians from 8:30 a. m. to 12 noon on Wednesday, June 8. Further details will appear in early issues of THE JOURNAL.

JOINT COMMITTEE ON SCHOOL HEALTH PROBLEMS

Health of the school child will be the chief topic for discussion at the annual meeting of the Joint Committee on Health Problems in Education of the A. M. A. and the National Education Association, March 14-16 at A. M. A. headquarters, Chicago. The group will discuss for future publication in pamphlet form (1) rest and sleep problems of growing children; (2) health status of school personnel, including the need for periodic physical examinations and x-rays for all teachers, administrators, custodians, bus drivers, cafeteria workers, and others who come in contact with children; and (3) nutrition problems, covering the relation of the school lunch to the three daily nutritious meals a child needs and the sanitary aspects of preparing and serving food in schools. Dr. Raymond Bjork, Helena, Mont., is chairman of the Joint Committee; Fred V. Hein, Ph.D., of the A. M. A.'s Bureau of Health Education is secretary. Organized in 1911, the Joint Committee now is composed of five representatives from the A. M. A. and five from the N. E. A.

NEW BOOKLET ON UNION HEALTH CENTERS

Just off the presses is the revised edition of the "Union Health Centers" booklet that describes 17 union-sponsored health centers located in 12 cities and eight states. The 48-page pamphlet was prepared by the Committee on Medical Care for Industrial Workers, a joint committee of the Councils on Medical Service and Industrial Health. Copies are available on request from the Council on Medical Service.

"TODAY'S HEALTH" CONTEST WINNERS

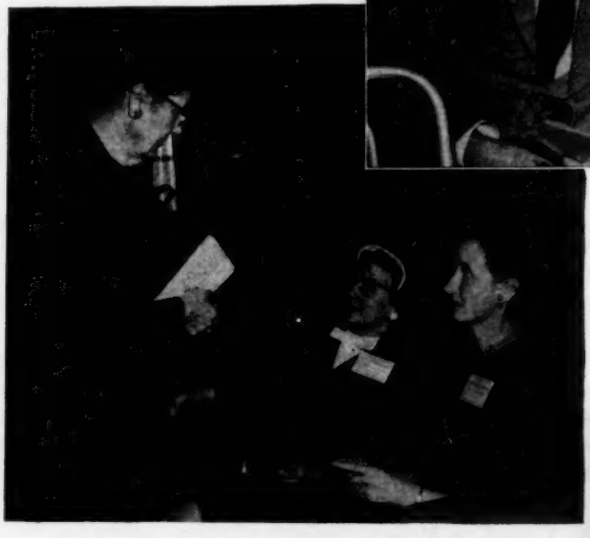
Four woman's auxiliary groups in the country received awards for their efforts in "Operation Christmas," *Today's Health* gift subscription contest. Award certificates were presented to the following local societies: group 1 (1-18 members), Sevier-Polk counties, Arkansas; group 2 (19-35 members), Washington County, Oregon; group 3 (36-99 members), Yellowstone County, Montana; and group 4 (100 members or over), Dade County, Florida. The contest was sponsored by the Woman's Auxiliary to the A. M. A. Mrs. Richard F. Stover of Miami is national *Today's Health* chairman.

CONFERENCE ON RURAL HEALTH

Above: Members of the A. M. A.'s Council on Rural Health at the annual Conference on Rural Health banquet in Milwaukee. Left to right, Drs. F. S. Crockett, West Lafayette, Ind., Council Chairman; Allen T. Steward, Lubbock, Texas; Norman H. Gardner, East Hampton, Conn.; Carll S. Mundy, Toledo, Ohio, Council vice-chairman; W. J. Weese, Ontario, Ore.; Willard A. Wright, Williston, N. D.; Fred A. Humphrey, Fort Collins, Colo.; Charles R. Henry, Little Rock, Ark.; and Henry A. Randel, Fresno, Calif. The 10th member of the Council, George F. Bond, Bat Cave, N. C., is on active duty with the Navy and was unable to attend the conference.

Below: Discussing the importance of the doctor's role in rural health are William G. McVay, Kansas City, Mo., American Academy of General Practice; J. E. Wyatt, M.D., Pocatello, Idaho; Carroll Andrews, M.D., Sonoma, Calif.; and James F. Maser, M.D., Rice Lake, Wis.

Left: Interested members of the conference audience were Harry Papcke, Madison, Wis., Dane County Agricultural Extension Service, and James Daentl, De Forest, Wis., 4-H Club leader.



Above: Three agricultural extension workers take time to go over mutual problems. Left to right, Blanche Lee, Madison, Wis., University of Wisconsin; Margaret Jacobson, St. Paul, Minn., University of Minnesota; and Louise Rosenfeld, Ames, Iowa, Iowa State College.

Below: As a special feature of the Rural Health Conference, radio station WGN, Chicago, recorded a half-hour program, "The Farmer Inquires." Participants were Robert N. Barr, M.D., Minneapolis; Norman Kraeft, Chicago, WGN Farm Service Director; H. E. Slusher, Jefferson City, Mo., representing the American Farm Bureau Federation; Beatty H. Dimit, Indiana, Pa., representing the National Grange; and F. S. Crockett, M.D., Lafayette, Ind., Chairman, A. M. A.'s Council on Rural Health.

NATIONAL CONFERENCE ON RURAL HEALTH

About 600 physicians, farm organization officials, agricultural extension workers, farmers, and others registered for the 10th National Rural Health Conference in Milwaukee, Feb. 24-26. Numerous other participants spent part or all of one day in the sessions but were not registered. The conference, which marked an anniversary of the A. M. A. Council on Rural Health, had as its theme "Looking Both Ways." The speakers stressed past achievements as a guide to reaching future goals.

One of the important aspects of the meeting were the continuous discussions of practical problems in informal gatherings, even after the discussion in the planned sessions. The program was built around four main topics: farm and home safety, family responsibility for health, using available health and medical resources, and how the job is done. Several talks were reports on successful local programs, such as a West Virginia "Happy Minds" project or a Wisconsin community-wide rescue squad organization. The medicine-labor cooperative effort in improving health care for isolated areas in Tennessee was fully described in a paper written by Ed Bridges, Nashville, Tenn., public service director of the Tennessee State Medical Association. The paper was read by William Cook, M.D., chairman, committee on rural health of the Tennessee State Medical Association.

Dr. F. S. Crockett, Lafayette, Ind., Chairman of the Council, set the keynote for the meeting, in discussing the Council's progress in the past 10 years. Dr. Crockett was honored for his 10 years of service at the conference banquet, when A. M. A. Assistant Secretary Ernest B. Howard presented him with a watch. A similar gift was presented by Dr. Carll S. Mundy, Toledo, Ohio, vice-chairman, to Mrs. Charles Sewell, Otterbein, Ind., one of those originally responsible for the Council's formation.

A. M. A. Trustee Leonard W. Larson, who spoke at the Saturday luncheon, pointed out that the success of the national conferences is "an example of what can be done for the betterment of society when people get together in a spirit of good will and mutual understanding." Chicago radio station WGN broadcast a half-hour interview with several participants on "The Farmer Inquires," and the "National Farm and Home Hour" devoted time on its network show to interviews on most of the meeting highlights.

Other speakers were Dr. George F. Lull, Chicago, Secretary and General Manager of the A. M. A.; Dr. A. J. McCarey, Green Bay, Wis., president of the State Medical Society of Wisconsin; Mrs. Frances Macdonald, Bozeman, Mont., Montana State College Agricultural Extension health specialist; Joseph Banach, Marinette, Wis., Ansul Chemical Company safety director; Alfretta E. Dickinson, Rockford, Ill., University of Illinois extension service home advisor for Winnebago County; Mrs. Charles Sewell, Otterbein, Ind., advisory member of the Council on Rural Health; and Mrs. George Turner, El Paso, Texas, president of the A. M. A. Woman's Auxiliary.

NEW TELEVISION "LINE" FOR 1955

The A. M. A. Bureau of Health Education has some 25 programs earmarked for local communities. The production schedule calls for completion of work by June 1. The Bureau plans to distribute its "products" to medical societies for airing over local television stations. The catalog listing includes: 1. "What to Do" series, six new five-minute films, featuring Abby Lewis, Broadway and television actress, and Dr. W. W. Bauer, Bureau director, on subjects such as backache, hay fever, eye injury, skin problems, baseball finger, and dizziness. 2. Script clips include six complete films and accompanying scripts to be narrated by a local doctor. Subjects include normal eyesight and common defects, exercise and the heart, industrial accidents, the nervous system, poliomyelitis, and crippling in arthritis. 3. Rural health scripts, prepared in cooperation with the Council on Rural Health, consist of 13 scripts to be used in live participation shows by doctors, veterinarians, county agents, 4-H personnel, and agricultural leaders. Subjects include rabies; brucellosis; home pasteurization of milk; pure water supply from farm wells; balanced diet; septic tanks; the place of minerals and vitamins in diet; food, growth, and medical care; weight control; health examinations; family or personal physician; accidents in the home; and health insurance policies.

To permit readers of THE JOURNAL *to become better acquainted with the activities of the state medical associations, articles describing them will appear from time to time in these pages.*—ED.

NEW MEXICO MEDICAL SOCIETY

At the instigation of Dr. E. H. Skipwith, on Dec. 31, 1881, six physicians in Las Vegas organized the Las Vegas Medical Society and two weeks later approved their constitution and bylaws and adopted the code of ethics recommended by the American Medical Association. In that year, coincident with the establishment of the first medical society in New Mexico, the first medical law was passed in the territory. It empowered the governor of New Mexico to appoint seven reputable physicians to constitute a New Mexico Board of Health and Medical Examiners that should "upon the production of evidence satisfactory to it license without examination any reputable physician who is a graduate of a Medical College in good standing and which has as high a standard as that required by the Association of American Medical Colleges." Because of the interest evinced in the Las Vegas Medical Society during the next four years by physicians throughout the territory, Dr. W. R. Tipton, president of the society, advocated a territory-wide organization. On Dec. 16, 1885, the board of directors of the Las Vegas Medical Society passed a resolution that the members of that society

Offices of the New Mexico Medical Society are located in rooms 223 and 224 of the First National Bank Building in Albuquerque.

should be considered members of the new body, the New Mexico Medical Society, and should be entitled to all the rights and privileges of the corporate members. The territorial society adopted the constitution and bylaws of the parent body, and all officers of the Las Vegas Medical Society were continued in office in the New Mexico Medical Society until the next annual meeting.

The society now has a membership of 474 physicians, or about 95% of all physicians in the state who are in private practice and eligible for membership. The 18 county societies are visited annually by the president, executive secretary, public relations chairman, and executive secretary, who discuss with them public relations programs on the state and county level and various problems facing organized medicine. The state society has been active in encouraging physicians to practice in the rural communities of the state. It is planned that a booklet containing information on each county, being prepared by the rural health committee, will be sent to physicians who inquire about the possibilities of entering practice in New Mexico.

The New Mexico Medical Society maintains headquarters in the First National Bank Building in Albuquerque, under the supervision of the executive secretary, Mr. Ralph R. Marshall. At the annual meeting in Santa Fe, the following officers were chosen for 1954-1955: Drs. John F. Conway, Clovis, president; Stuart W. Adler, Albuquerque, president-elect; Earl L. Malone, Roswell, vice-president; and Lewis M. Overton, Albuquerque, secretary-treasurer. The next annual meeting will be held in Albuquerque May 4-6.

NEW EDITION OF HEALTH INSURANCE BROCHURE

Current information on insurance benefits, enrollments, and other pertinent data is being gathered by the A. M. A.'s Council on Medical Service for the 1955 edition of its Health Insurance Brochure. Questionnaires have been circulated by the Council's Committee on Prepayment Medical and Hospital Service to various insurance plans. This ninth edition should be available for distribution early in the summer. Although the Council has discontinued its seal of acceptance program for health insurance benefit plans, this in no way minimizes its interest in the broad aspects of the insurance field. In approving the discontinuance of the seal program, the House of Delegates has made it clear that all other activities will be continued and intensified.

NEW PLACEMENT AIDS

Information for doctors seeking new locations to practice and communities looking for a doctor may be found in two new physicians' placement service booklets to be issued late in the spring by A. M. A.'s Council on Medical Service. The first, "Physicians Placement Service—1955," deals with the present operations of the placement service, giving special attention to the activities of the services maintained by, or in cooperation with, state medical societies. The second booklet answers the question from civic leaders, "What have other communities done to attract physicians?" Brief accounts of modern medical facilities that have been made available to physicians by a number of communities are presented. This pamphlet complements the 1953 booklet, "A Doctor for Your Community."

FEDERAL MEDICAL LEGISLATION

Fifth Installment, First Session, 84th Congress

Commission on Aging and Aged

Senator Ives (R., N. Y.), in S. 658, and Congressman Coudert (R., N. Y.), in H. R. 2825, propose to establish a commission on programs for the aging. This 25 member fact-finding commission would "study and investigate problems stemming from the increasing proportion of aging persons in the Nation's population, and remedial measures including but not restricted to, care and services in the home, use of foster home facilities, recreation centers, and provision of institutional facilities for the chronically ill." The membership of the commission would consist of the Secretary of HEW and 14 members named by the President, 5 members named by the Vice-President, and 5 members named by the Speaker of the House. There is no specification in the bill that any of these must be physicians. A final report with recommendations would be submitted before July 1, 1956, and the commission would expire Dec. 31, 1956. Similar bills were introduced by Congressman Laird (R., Wis.) in the House, H. R. 3254, and in the Senate, in S. 693, by Senator Potter (R., Mich.) for himself, and Allott (R., Colo.), Barrett (R., Wyo.), Beall (R., Md.), Bricker (R., Ohio), Bender (R., Ohio), Bush (R., Conn.), Bridges (R., N. H.), Capehart (R., Ind.), Carlson (R., Kan.), Cotton (R., N. H.), Case (R., N. J.), Case (R., S. D.), Chavez (D., N. Mex.), Duff (R., Pa.), Douglas (D., Ill.), Dirksen (R., Ill.), Ervin (D., N. C.), Eastland (D., Miss.), Flanders (R., Vt.), Goldwater (R., Ariz.), Green (D., R. I.), Hruska (R., Neb.), Hickenlooper (R., Iowa), Humphrey (D., Minn.), Ives (R., N. Y.), Jackson (D., Wash.), Johnston (D., S. C.), Kuchel (R., Calif.), Kennedy (D., Mass.), Kilgore (D., W. Va.), Langer (R., N. D.), Lehman (D., N. Y.), Mundt (R., S. D.), Martin (R., Pa.), Malone (R., Nev.), Mansfield (D., Mont.), Magnuson (D., Wash.), Murray (D., Mont.), Neuberger (D., Ore.), Payne (R., Maine), Purtell (R., Conn.), Pastore (D., R. I.), Saltonstall (D., Mass.), Smith (R., Maine), Schoeppel (R., Kan.), Smathers (D., Fla.), Sparkman (D., Ala.), Scott (D., N. C.), Thye (R., Minn.), Thurmond (D., S. C.), Welker (R., Idaho), Wiley (R., Wis.), Watkins (R., Utah), and Young (R., N. D.). The Senate bills were referred to the Committee on Labor and Public Welfare; in the House, the Coudert bill was referred to the Committee on Interstate and Foreign Commerce and the Laird bill to the Committee on Education and Labor.

Prepared by Washington Office of the American Medical Association.

Veterans' Neuropsychiatric Hospital for Florida

Senator Smathers (D., Fla.) and Senator Holland (D., Fla.), in S. 673, have introduced an identical measure to H. R. 1820 by Congressman Matthews (D., Fla.) that would authorize and direct the Administrator of the Veterans' Affairs "to construct a Veterans' Administration neuropsychiatric hospital of one thousands beds at Gainesville, Florida." The Senate bill was referred to the Committee on Labor and Public Welfare, and the House measure was referred to the Committee on Veterans' Affairs.

Medical Care for Dependents of Coast Guardsmen

Congressman Seely-Brown (R., Conn.) proposes, in H. R. 2665, that "dependents of military personnel of the Coast Guard shall be eligible, subject to the same conditions and limitations as apply to dependents of military personnel of the Navy, for hospitalization and medical, surgical, and dental care in hospitals and dispensaries operated by the Armed Forces at places outside the Continental United States and at other places where hospitals operated" by the Public Health Service are not available. This is similar to S. 453, previously reported, by Bible (D., Nev.). This bill was referred to the Armed Services Committee.

U. S. Armed Forces Medical Academy

Congressman Bennett (D., Fla.) and Senator Capehart (R., Ind.) have introduced H. R. 2096 and S. 781, which would provide for the establishment of a United States armed forces medical academy to train selected persons for service as doctors with the armed forces. A commission would assist the Secretary of Defense in the selection of a site, but the Secretary would be responsible for constructing and equipping the school and for determining the requirements for acceptance of students. The cadet total would be limited to 600 at any one time, with one nomination allotted to each Senator and Representative, 4 each to the Army, Navy, and the Air Force, and 16 to the President. Vacancies would be filled by competitive examinations among those nominated, the curriculum requirements to be the same as for accredited medical schools, but emphasis would be upon military medicine and civil defense. Each man would be required to serve after graduation five years on active duty in the Army, Navy, or Air Force. After this period, he could, on request, be assigned to inactive duty but would remain in the reserve, subject to a three year period of active duty at the discretion of the Secretary of Defense, unless such reserve officer would be practicing medicine in an area designated by the Surgeon General of the U. S. Public Health Service as a "doctor shortage area." An original appropriation of 25 million dollars would be authorized. These bills were referred to the Committee on Armed Services in the House and Senate.

Medical Care for Dependents of Military Personnel

Congressman Vinson (D., Ga.), in H. R. 2685, and Congressman Brooks (D., La.), in H. R. 3009, have introduced an administration measure to provide a uniform program of medical care for dependents of members of the armed forces "as an important factor in the creation and maintenance of high morale throughout the Armed Forces because it assures military personnel at home and overseas that the medical care of their dependents is being provided for by the Department of Defense." The bill is based upon the Moulton Citizens Advisory Commission's report of June, 1953.

Member of the Armed Forces Defined.—A member of the armed forces is defined as "(1) a person appointed or enlisted in, or inducted, called, or conscripted into, the Army, Navy, Air Force, Marine Corps, or the Coast Guard when operating as part of the Navy, or members of the Reserve components who have entered an extended active duty in excess of ninety days but not including persons on duty for training purposes only; and (2) a member or former member of the Army, Navy, Air Force, or Marine Corps, who is or has been awarded retired, retirement, or retainer pay or equivalent pay as a result of service in the Army, Navy, Air Force, or Marine Corps," except those retired on longevity as members of the reserve. At the present time medical care for dependents varies within the services and geographically. The administration proposal would make the practices uniform in the three services.

Dependents Defined.—"The term 'dependent' includes—(1) in the case of any male member—(A) his lawful wife; (B) his unmarried dependent legitimate children, adopted children, or stepchildren under twenty-one years of age or such unmarried legitimate children, adopted children, or stepchildren over twenty-one years of age who are incapable of self-support because of being mentally or physically incapacitated and who are in fact dependent on him for over half of their support; and (C) his parents and parents-in-law if in fact dependent on him for over half of their support; and (2) in the case of any female member—(A) her lawful husband, if in fact dependent on her for over half of his support; (B) her unmarried legitimate children, adopted children, or stepchildren under twenty-one years of age if they are in fact dependent on her for over half of their support or such unmarried legitimate children, adopted children, or stepchildren over twenty-one years of age who are incapable of self-support because of being mentally or physically incapacitated and who are in fact dependent on her for over half of their support; and (C) her parents and parents-in-law if in fact dependent on her for over half of their support. Widows and the dependent children of deceased members of the Armed Forces as defined in this Act at the time of death are authorized medical care under the terms of this Act in military medical facilities. Widows and dependent children are not authorized medical care at Government expense through civilian medical sources and shall not be entitled to medical care after the widow remarries."

Medical Care Limited.—"Medical care under this act is limited to the following: (a) diagnosis, (b) acute medical and surgical conditions, (c) contagious diseases, (d) immunization, (e) maternity and infant care."

Type of Care and Equipment Not Authorized.—"Hospitalization shall not be authorized dependents of members of the Armed Forces for the following: (a) domiciliary care and chronic diseases, (b) nervous and mental disorders (except for diagnostic purposes), (c) elective medical and surgical treatments as determined by the cognizant physician. Dependents of members of the Armed Forces shall not be provided prosthetic devices, hearing aids, orthopedic footwear, and spectacles, except that outside the continental limits of the United States and at remote stations within the continental limits of the United States where adequate civilian facilities are not available, these items, if available from military stocks, may be provided to dependents at prices representing full cost to the Government.

"(b) Dependents of members of the Armed Forces shall not be provided—(1) ambulance service, except in acute emergency; and (2) home calls, except in special cases where it is determined by the cognizant physician to be medically necessary."

Dental Care.—"Except outside the continental limits of the United States and in remote areas within the continental limits of the United States where adequate civilian dental facilities are not available, dental treatment for dependents of members of the Armed Forces will be restricted to emergency dental care and dental care as a necessary adjunct to medical or surgical treatment. Emergency dental care is defined as the care required to relieve pain and suffering and shall not include any permanent restorative work or dental prosthesis. Dental treatment which may be provided dependents of members of the Armed Forces under this section will be obtained in military dental facilities and will depend upon the availability of space, facilities, and capabilities of the dental staff. Dependents of members of the Armed Forces are not authorized dental care at Government expense through civilian dental sources, except as a necessary adjunct to inpatient medical or surgical treatment."

Who Will Furnish Care.—Medical care for dependents will be furnished in military facilities and by doctors in uniform if practicable. The proposal specifically provides: "(a) Military medical facilities will be used for the medical care of dependents of members of the Armed Forces subject to the availability of space, facilities, and capabilities of the medical staff. The medical care of dependents of members of the Armed Forces provided for in military medical facilities shall in no way interfere with the primary mission of the military medical services to provide proper medical care for military personnel. (b) When military medical facilities are not available or capable of providing the authorized type of treatment required for dependents of members of the Armed Forces or where the situation is of a medical emergency nature, as defined by regulations prescribed by the Secretary of Defense, medical care is authorized at Government expense from duly licensed civilian physicians and surgeons and duly accredited hospital and treatment facilities under civilian control. However, no funds shall be expended for professional services except in accordance with schedules of maximum fees and costs for such professional services established by the Secretary of Defense. In establishing such schedules the Secretary of Defense may consult with accredited medical associations and any other agencies which he considers appropriate. The payment for services rendered by hospitals and clinics shall be at rates not in excess of the hospital's or clinic's standard schedule of charges for semiprivate accommodations to the general public or to group-insurance patients (whichever is lower) for the services rendered.

"As a restraint on excessive demands for medical attention, dependents receiving medical care shall be responsible for contributing to the cost thereof, as follows: (1) In civilian medical facilities, the dependent shall be required to pay the first $10 of the cost of each illness (except in maternity cases) and in addition thereto, not in excess of 10 per centum of the total cost; (2) In military medical facilities, charges shall be limited to such amounts, if any, as may be established by the Secretary of Defense pursuant to a special finding that such charges are necessary."

Insurance Could Be Used.—"The Secretary of Defense may, if he finds it more economical, contract for such medical care of dependents under such private insurance plan as he deems appropriate." This bill was referred to the Committee on Armed Services. Senator Russell (D., Ga.) and Senator Saltonstall (D., Mass.), by request, introduced an identical bill in the Senate, S. 934, which was referred to the Committee on Armed Services.

Congressman Rivers (D., S. C.), in H. R. 2436, would direct the Secretary of Defense and the Surgeon General of the Public Health Service to provide immediately "where practicable for hospitalization and medical care in hospitals and dispensaries under the jurisdiction of the uniformed services, for the dependents . . . of members of the uniformed services, under regulations prescribed by the Secretary of Defense for the armed services, and under regulations prescribed by the President . . . at such per diem or other rate as the President may prescribe for such dependents. In order to accomplish the purposes of this Act, the Secretary of Defense shall, where practical, reactivate to the extent necessary any military or naval hospital facilities under his jurisdiction, and utilize to the fullest extent practicable all existing facilities and reactivated facilities. (c) The medical facilities of all uniformed services shall be made available under this Act to dependents without regard to the branch of the uniformed services to which the member concerned belongs, and without regard to the branch of service under whose jurisdiction the facility is maintained."

Mental Health Commission

Senator Purtell (R., Conn.), in S. 724, proposes "to establish a Commission on Mental Health, and to provide for a study of the problems of mental illness and for the development of a national mental health program." The commission would consist of a chairman and 17 other members appointed by the President. "Members of the Commission shall be eminent representatives of the fields of psychiatry, mental hospital administration, medical education, physical medicine and rehabilitation, and allied mental health fields, and of representatives of the Council of State Governments." The commission would make a report with recommendations not later than 30 months "following the enactment of this Act. Upon completion of its inquiry and transmittal of its recommendations . . . it shall be the duty of the Commission to conduct a continuing review and evaluation of the status, progress, and problems incident to the provision of care and treatment for the mentally ill, and to report annually to the President and the Congress the results of its review and evaluation, together with such recommendations as it deems desirable." The sum of 1 million dollars would be authorized for the first year and $1,500,000 for each fiscal year thereafter. "The Commission shall cease to exist ten years after the enactment of this Act." This bill was referred to the Committee on Labor and Public Welfare.

MEDICAL NEWS

CALIFORNIA

Society News.—The Los Angeles Society of Internal Medicine and the Los Angeles Diabetes Association will hold a dinner meeting at 6:30 p. m., March 30, in the lounge of the Los Angeles County Medical Association. At 8 p. m. Dr. Randall G. Sprague, professor of medicine, Mayo Foundation, Rochester, Minn., will discuss Cushing's syndrome. Guests are welcome.

Parasitology Course.—The University of California division of postgraduate medical education will offer a course in diagnostic parasitology for laboratory technicians on Tuesdays, 7 to 10 p. m., March 29-July 5. The course, which will be given in the Life Sciences Building, room 2305, adjacent to the new medical center at the University of California at Los Angeles School of Medicine, will provide advanced training in clinical laboratory diagnosis of the protozoan and helminthic parasites affecting man. It is open to all licensed or experienced medical laboratory technicians with consent of the instructors.

New Hospital at San Diego.—The Donald N. Sharp Memorial Community Hospital will be dedicated in San Diego, March 27-April 3. Public tours are being arranged throughout the week, with the official ceremonies set for April 2-3, when the surgeon general of the U. S. Public Health Service, Dr. Leonard A. Scheele, will make the dedication. When completed the $4,500,000 building will have nine stories, with three penthouse levels, and a two story service wing. The present structure was designed to accommodate 250 beds, but already a $2,100,000 expansion program is under advisement. Every patient room will have a piped oxygen system, a voice receiver connected with the nurses' central station, and large picture windows overlooking a panoramic view. An innovation has been made in the surgical operating lights, which are composed of multiple low-wattage lamps, making the light cooler and more comfortable to the surgeon. The central spot in the fixture can be removed at will and replaced by a mechanical camera, which the surgeon controls through a foot pedal, so that he can record pictorially any phase of an operation he desires.

CONNECTICUT

Conference on Pediatric Cardiology.—The seventh conference on "The Public Health Aspects of Rheumatic Fever and Pediatric Cardiology" conducted by the department of pediatrics of the Grace-New Haven Community Hospital will be held March 28-April 7. Physicians, nurses, medical social workers, and others concerned with state or local rheumatic fever programs are invited. Requests for information should be addressed to Dr. Ruth Whittemore, Department of Pediatrics, Yale University School of Medicine, 333 Cedar St., New Haven 11.

DISTRICT OF COLUMBIA

Personal.—Dr. James Alexander Lyon recently returned to Washington, D. C., after spending several weeks in Europe, where he visited Portugal, Spain, France, Italy, and Ireland. Dr. Lyon presented a paper, "Evaluation of Certain Cardiac Arrhythmias," before the third International Congress on Diseases of the Chest sponsored by the American College of Chest Physicians in Barcelona, Spain, and by invitation served on the panel discussion of cardiovascular diseases.

Kober Lecture.—Dr. James Howard Means, acting director of the health department at Massachusetts Institute of Technology, Boston, will give the 31st annual Kober Lecture, "The Nature of Medical Research," in Gaston Hall, Georgetown University, 37th and O streets, N. W., Washington, D. C., March 28, at 8:15 p. m. The Kober Lecture is provided for by the Kober Foundation set up in 1923 by Dr. George M. Kober to commemorate the 50th anniversary of his graduation from the Georgetown School of Medicine.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

FLORIDA

Society News.—Newly elected officers of the Greater Miami Radiological Society include Dr. David Kirsh, Miami, president; Dr. Albert M. McCallen, Coral Gables, vice-president; and Dr. Andre S. Capi, Hollywood, secretary-treasurer.

Institute on Forensic Medicine.—The University of Miami Law School, in co-sponsorship with the Florida Bar Association, will conduct its Legal Institutes March 28-30 at the Roney Plaza Hotel, Miami Beach, immediately preceding the annual convention of the bar association. In the afternoon, March 30, the Medical Jurisprudence Institute will be held under the chairmanship of Dr. Franklin J. Evans, a member of the Dade County Medical Association and of the faculty of the University of Miami Law School. Among the guest speakers will be Dr. Alexander S. Wiener, Brooklyn, who will present "Medico-Legal Aspects of Blood Typing and Blood Transfusions." Physicians of Miami are invited.

GEORGIA

Dr. Kay Day.—Nov. 14, 1954, was designated as "Dr. Kay Day" in Byron. A reception was held at the Byron Auditorium, and Dr. and Mrs. James B. Kay were presented with a silver service by the people of Byron and other middle Georgia communities. Dr. Kay has practiced in Byron for 35 years.

Lecture by Dr. Louis Katz.—The Beta Nu chapter of the Phi Delta Epsilon fraternity at the Emory University School of Medicine, Emory University, will hold its ninth annual lectureship March 30 at Grady Memorial Hospital, Atlanta. Dr. Louis N. Katz, director of the Cardiovascular Research Center of the Medical Research Institute, Michael Reese Hospital, Chicago, will discuss "Hormonal Control of Atherosclerosis."

Alumni and Homecoming Events at Emory.—In conjunction with Emory University alumni day and spring homecoming events, March 31-April 2, the Medical Alumni Association, Emory University School of Medicine, Emory University, will sponsor the Emory Postgraduate Medical Clinics. Registration fee for the clinics will be $5, and tickets for the alumni banquet will be $6.50 a plate. At 11 a. m., Thursday, in the Emory University Hospital Auditorium the William Simpson Elkin Memorial Lecture, "Diseases of the Thyroid," will be delivered by Dr. Bentley P. Colcock, Lahey Clinic, Boston. After luncheon in Alumni Memorial Building dining room (as guests of the university), the panel discussion on treatment of hyperthyroidism will be moderated by Dr. Ira A. Ferguson, Atlanta. There will be a tea in the Medical Library in Woodruff Memorial, 3 to 4 p. m. The Friday session in Grady Memorial Hospital Auditorium will include the William Chester Warren Sr. Memorial Lecture by Dr. Joseph J. Bunim, chief of the arthritis and rheumatism branch, Institute of Arthritis and Metabolic Diseases, U. S. Public Health Service, Bethesda, Md., whose topic will be "The Newer Drugs in the Treatment of Arthritis." The university will be host at a buffet luncheon in the Student Lounge of Glenn Memorial Building, after which a clinical pathological conference will be presented by Dr. Walter H. Sheldon, Atlanta. At 2 p. m. Dr. Vernon E. Powell, Atlanta, will moderate a panel discussion on arthritis. The social hour at the Capital City Club (Peachtree and Harris streets) will be followed by the annual Medical Alumni Association banquet at 7:30 p. m. Wives and friends are invited to the social hour and the banquet (formal dress optional).

ILLINOIS

Rabies Quarantine Canceled.—The rabies quarantine in Chicago and suburban Cook County was lifted Feb. 4, since no rabid dog had been found in the county for 60 days. The quarantine was established in Chicago, Dec. 17, 1953, and in suburban Cook County, Feb. 17, 1954. In 1954, according to Edward C. Khuen, D.V.M., Cook County rabies inspector, 75 rabid dogs were found in Chicago and 47 in the rest of the county.

Secretaries' Conference.—The annual Secretaries' Conference will open at 9 a. m., March 27, at the Hotel Leland, Springfield. Among the topics for discussion are "Long-Range Planning by County Medical Societies," "Malpractice Insurance and Current Trends," "I. P. A. C. Problems," "Auxiliary Cooperation," and "Press-Radio-Television Plans and Possibilities." All presidents, secretaries, public relation chairmen, and other interested members of county medical societies are invited to participate in the discussions.

Personal.—Dr. T. William Lester Jr., associate professor of medicine at the University of Chicago Clinics and director of the Student Health Service, has been appointed chief of staff of the Suburban Cook County Tuberculosis Hospital Sanitarium. ——Dr. George A. Dicus, who at the age of 91 has practiced medicine and surgery in Streator for 63 years, was recently honored at an Americanism dinner given by the American Legion. Dr. Dicus, who received the Legion's merit award, was honored by the Illinois State Medical Society last May as the state's outstanding practitioner of 1954.

Chicago

Personal.—Dr. Noah D. Fabricant, clinical assistant professor of otolaryngology, University of Illinois College of Medicine, will lecture on "Physiologic Approach to Nasal Medication" and "Modern Medication of the External Auditory Canal" at the annual guest meeting of the Kansas City O. O. R. L. Society, April 4-8. The meeting, sponsored by the University of Kansas in cooperation with the Kansas City Society of Ophthalmology and Otolaryngology, the Kansas Medical Society, and the Kansas State Board of Health, will convene at the University of Kansas Medical Center, Kansas City, Kan.

Council of Child Psychiatry.—A group of 24 child psychiatrists of the Chicago area has formed the Chicago Council of Child Psychiatry for the exchange of information and ideas in the field of child psychiatry and those fields pertaining to the promotion of mental health of children. The council will encourage support and development of community resources and services contributing to these aspects of child welfare. Officers elected for 1954-1955 are: Dr. George J. Mohr, president; Dr. Eugene I. Falstein, vice-president (and president-elect); and Dr. George L. Perkins, secretary-treasurer. Other persons on the executive committee for the same period are: Dr. Irene M. Josselyn, Dr. Sophie Schroeder-Sloman, and Dr. Harry M. Segenreich.

KENTUCKY

Samuel Gross Lecture.—Phi chapter of the Phi Delta Epsilon Fraternity at the University of Louisville School of Medicine will sponsor the 15th annual Samuel D. Gross Lecture, March 28 at 12 noon at the Fred Rankin Memorial Amphitheater, Louisville General Hospital. The guest speaker will be Dr. Isidore Snapper, director of medical education, Beth-El Hospital, Brooklyn, whose topic will be "Bone Disease and Bone Metabolism." The lecture this year honors the sesquicentennial of Dr. Samuel David Gross, who was born near Eaton, July 8, 1805. He served as professor of surgery at the University of Louisville from 1840 to 1856, resigning thereafter to accept a similar position at his alma mater, Jefferson Medical College of Philadelphia.

MARYLAND

Society News.—At the annual meeting of the Maryland State Homeopathic Medical Society Dr. Julius Chepko, Westminster, was elected president; Drs. Arthur J. Davies, Baltimore, and J. Miller Kenworthy, Annapolis, vice-presidents; Dr. Robert H. Reddick, Cambridge, secretary; and Dr. Maurice E. Shamer, Baltimore, treasurer.

Pediatric Seminar.—Dr. J. Edmund Bradley, head of the department of pediatrics, University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, announces the fourth annual Pediatric Seminar, March 27, in Gordon Wilson Hall, University Hospital. The day and the following program are in honor of Dean H. Boyd Wylie:

Robert B. Greenblatt, Augusta, Ga., Some Common Endocrine Disorders of Childhood.

Eugene B. Spitz, Philadelphia, Head Injuries in Children.

Bret Ratner, New York, Psychosomatic Aspects of Pediatric Allergic Conditions.

Stewart H. Clifford, Brookline, Mass., Some Problems of the Newborn.

Luncheon will be served to all guests in the University Hospital. The committee on arrangements is composed of Dr. Edward G. Field, chairman; Dr. Samuel S. Glick; and Dr. Frederick J. Heldrich Jr.

Postgraduate Course in Pediatrics.—Doctors Hospital (2724 N. Charles St., Baltimore 18) will give a postgraduate course in pediatrics April 1-May 20. There will be four night panels (Hazards of Birth and the First Days of Life; Neurologic Diseases; Psychiatric Disturbances in Children; and Pediatric Emergencies); three afternoon panels (Ear, Nose and Throat; Diabetes and Kidneys; and Tumor and Cancer); and six round-table luncheons (Examination of the Newborn Infant; Treatment of Diarrhoeas on an Outpatient Basis; Immunization Against Communicable Diseases; Childhood Asthma; Febrile Convulsions; and Miscellaneous Pediatric Problems), a total of 13 sessions covering 20 hours of instruction. Panelists and lecturers are members of the faculties of the medical schools of the Johns Hopkins University and the University of Maryland. A token fee of $5 is charged to help defray the cost of luncheons and refreshments (following night panels).

MASSACHUSETTS

Personal.—Dr. Merrill Moore, Squantum, a colonel in the Army Medical Corps Reserve, has been awarded the Army Commendation Ribbon for outstanding service at Nanking, China, in 1946.

Tufts Alumni Dinner Meeting.—The annual dinner meeting of the Tufts Medical Alumni Association will be held March 30, 6:30 p. m., at the Somerset Hotel, Boston. The guest speaker will be the Hon. Frank B. Berry, M.D., assistant secretary of defense (health and medical), who will discuss "Medical Education in National Defense." Rear Admiral Bartholomew W. Hogan, acting surgeon general of the United States Navy, will preside. Other speakers include Nils Y. Wessell, Ph.D., president of Tufts College; Dr. Joseph M. Hayman Jr., dean; Dr. Frank R. Ober, Boston; and Dr. Edward J. Crane, Holden.

MICHIGAN

Personal.—Dr. Norman F. Miller, chairman, department of obstetrics and gynecology, University of Michigan Medical School, Ann Arbor, will be the guest speaker at a postgraduate course in obstetrics and gynecology to be offered by the University of Washington School of Medicine, Seattle, March 30-31. One day will be devoted to obstetrics and the other to gynecology. Dr. Russell R. de Alvarez, executive officer, department of obstetrics and gynecology, University of Washington School of Medicine, Seattle, is chairman of the postgraduate course. Registration is not limited; tuition, $20.

Venereal Disease Control Program.—According to the Michigan Department of Health, blood tests of 6,237 volunteers who participated in the venereal disease control program in the Detroit area from Oct. 12, 1954, to Jan. 14 show a positive test rate of 5.5% for syphilis. The program, which will be carried on in the Detroit area until March, will be continued in other parts of the state. This blood-testing program, conducted by Detroit's health department in cooperation with the Michigan Department of Health, was begun in Detroit in 1952, when blood tests on 40,514 persons showed a 6.7% positive test rate for syphilis.

MISSOURI

Meeting of Medical Technologists.—The Missouri Society of Medical Technologists will meet in the Municipal Auditorium, Kansas City, March 27-29. The scientific sessions will open Monday at 9:05 a. m. with "The Role of the Technician in Civil Defense," by Dr. Carroll P. Hungate, Kansas City, senior medical officer, Olathe Naval Air Station. Other presentations by physicians will include:

Comparison of Bone Marrow Spreads and Section, Harry Agress, St. Louis.

Blood Substitutes, Samuel L. Allen, Kansas City.

Blood Sugar Determinations, Priscilla White, Boston.

New Technics for the Detection of Amoebae, Charles C. Gullett, Kansas City.

NEBRASKA

Poynter Day Lecture and Assembly.—The annual Poynter Day Lecture and Postgraduate Assembly will be held at the University of Nebraska College of Medicine, Omaha, March 29-31. Guest speakers include: Drs. Melvin D. Yahr, professor of neurology, Columbia University College of Physicians and Surgeons, New York; Paul D. Bruns, associate professor of obstetrics and gynecology, University of Colorado School of Medicine, Denver; James C. Cain, consultant, division of internal medicine, Mayo Clinic, Rochester, Minn.; Amos Christie, professor of pediatrics, Vanderbilt University School of Medicine, Nashville, Tenn.; and Charles M. Pomerat, Ph.D., professor of cytology, University of Texas Medical Branch, Galveston, Poynter Day Lecturer.

NEW JERSEY

Meeting on Atomic Research.—The New Jersey Medical Women's Association is sponsoring an open meeting on the constructive uses of atomic energy at the Academy of Medicine of New Jersey, 91 Lincoln Park, March 27, 2:15 p. m. The speaker will be Brig. Gen. Elbert De Coursey of the U. S. Army Medical Corps. Physicians, their families, and friends are cordially invited.

Seminar for Technologists and Pathologists.—The fourth annual demonstration seminar and lectures of the New Jersey Society of Medical Technologists will be presented with the cooperation of the New Jersey Society of Clinical Pathologists, New Jersey State Department of Health, and State University of New Jersey (Rutgers) at 10 a. m., March 27, in the University Commons, Rutgers University, New Brunswick. All laboratory personnel and physicians are invited. The morning session will be devoted to technical demonstrations. Two films, "Hemoglobin Workshop" and "Rh Factor," will be shown continuously. After luncheon in the University Commons, greetings by Thomas K. Rathmell, Trenton, president, New Jersey Society of Clinical Pathologists, and Catherine Milos, M.T. (A. S. C. P.), president, New Jersey Society of Medical Technologists, will precede the following lectures:

The Hospital Laboratory from an Administrator's Viewpoint, Mr. J. Harold Johnston, executive director, New Jersey Hospital Association.

White Blood Cells in Health and Disease, Miss Geneva Daland, chief laboratory assistant in hematology, Thorndike Memorial Laboratory, Boston City Hospital.

Clinicopathological Problems in the Anemias, Robert A. Kritzler, assistant physician in internal medicine, Columbia-Presbyterian Medical Center; instructor in medicine at Columbia University College of Physcians and Surgeons, New York.

Interested technologists and pathologists are invited.

NEW YORK

Clinical Professor Appointed.—Dr. Louis J. Soffer, head of endocrinology at Mount Sinai Hospital in New York City, has been named clinical professor of medicine at the State University of New York College of Medicine at New York City, Brooklyn, effective April 1. Dr. Soffer, who was affiliated with Johns Hopkins University School of Medicine, Baltimore, from August, 1930, until October, 1936, is regional consultant in endocrinology to the Veterans Administration and a member of the advisory council of the section on medicine, New York Academy of Medicine.

Douglas P. Arnold Lectureship.—In Buffalo the sixth annual Douglas P. Arnold Lectureship will present Dr. Louis K. Diamond, associate professor of pediatrics, Children's Medical Center, Boston, as guest speaker March 31 and April 1. Thursday, at 4 p. m., Dr. Diamond will discuss "Erythroblastosis Fetalis: An Example of Sensitization Disease" in the Edward H. Butler Auditorium, University of Buffalo School of Medicine. Friday, at 8 p. m., in the Children's Hospital Auditorium, 235 Bryant St., Dr. Diamond's topic will be "Management of Purpura in Childhood." The lecture will be preceded by a subscription dinner in the Saturn Club honoring Dr. Diamond.

New York City

Dr. Goodman to Lecture Abroad.—Dr. Herman Goodman, associate clinical professor of dermatology and syphilology, New York University College of Medicine, has accepted an invitation to address the 14th Japan Medical Congress at Kyoto, Japan, in April. He will also exhibit his collection of 635 portraits of dermatologists and basic scientists. Dr. Goodman will return to New York sometime about the middle of May.

Award to Dr. Rusk.—The Phi Delta Epsilon medical fraternity presented its 1954 distinguished service award to Dr. Howard A. Rusk at the 50th anniversary banquet in the Waldorf-Astoria Hotel, Dec. 27. Dr. Rusk is director of the Institute of Physical Medicine and Rehabilitation at New York University-Bellevue Medical Center and an associate editor of the *New York Times*. He was selected for this award as an "outstanding educator and humanitarian, a pioneer in the field of physical medicine and rehabilitation, dedicated to restoring health and independence to those previously relegated to chronic infirmity."

Nathan B. Van Etten Hospital.—The first unit of the Bronx Municipal Hospital Center to be completed, the seven story, 500 bed Nathan B. Van Etten Hospital, was recently opened at Morris Park and Seminole avenues. The unit, on which work started in 1951, is the first large capital project to have been

Nathan B. Van Etten Hospital.

built entirely with funds from the 150 million dollar bond issue, exempt from the city's debt limit. Although built as a tuberculosis facility, the hospital initially will admit general care patients also. The hospital is named for the late Dr. Nathan B. Van Etten, a former President of the American Medical Association and the first president of the Bronx County Medical Society. Dr. Van Etten, who died July 23, 1954, was a past president of the New York Society of Jurisprudence, the Medical Alumni of New York University, the Greater New York Medical Association, the Medical Society of the State of New York, and the Bronx Tuberculosis and Health Association.

Personal.—Dr. George T. Pack has been invited to speak on surgical treatment of tumors of the liver at the annual Spring Clinic at De Paul Hospital in Norfolk, Va., March 30.——Dr. F. Peyton Rous, member emeritus of the Rockefeller Institute for Medical Research, delivered the annual Jean Redman Oliver Lecture at the State University of New York College of Medicine at New York City, Brooklyn, Feb. 24, on "Cancer Causation as Viewed Today."——Dr. Menard M. Gertler has been awarded a special research fellowship from the National Heart Institute, Bethesda, Md. Dr. Gertler is holding this fellowship in the department of biochemistry, New York University-Bellevue Medical Center, under the direction of Dr. Severo Ochoa.

OHIO

Society News.—In its seminar series the Southwestern Ohio Society of General Physicians, in collaboration with the University of Cincinnati College of Medicine, will offer "The Doctor, the Coroner, and the Law," March 27, from 9:30 a. m. to 3 p. m. in the medical school auditorium. The fee is $10. Residents, interns, medical students, and nurses will be admitted without fee. Information may be obtained from Dr. J. Robert Hudson, Secretary, 7017 Miami Ave., Madeira.

OKLAHOMA

Discussion of Antibiotic Therapy.—Dr. Henry A. Strade, associate medical director, E. R. Squibb & Sons, New York, will discuss "Practical Antibiotic Therapy" before the Tulsa Academy of General Practice, March 28, 8 p. m., at Hotel Tulsa. Reservations must be made by noon of the day of the meeting (telephone 2-5904). All physicians are invited to attend.

OREGON

Personal.—Major General John M. Hargreaves, U. S. A. F., MC, retired, has been appointed medical representative of the state civil defense medical department. General Hargreaves has served as deputy surgeon general of the Air Force and as command surgeon of the major Air Force commands in the United States and in the Far East.

Large Outbreak of Gastroenteritis.—According to the U. S. Public Health Service, in its release of Feb. 10, an outbreak of gastroenteritis in and surrounding the city of Portland began late in November and was still present. Epidemiological information was received from about 200 patients in 71 households throughout the area. The number of cases was estimated to be many thousands. *Giardia lamblia* was identified more frequently in stool specimens from the patients than any of the common enteric pathogens. Studies were in progress, but it was believed that it would be difficult to establish the true causal agent and the mode of spread of this outbreak.

PENNSYLVANIA

Seminar on Pharmaceutical Practice.—The Philadelphia College of Pharmacy and Science will hold a seminar on modern pharmaceutical practice, March 29-31. Topics to be discussed include the newer immunizing agents, antibiotics, the causes and treatment of cardiovascular diseases, radioisotopes in medicine and pharmacy, recent important drugs, sources of technical information, the economic future of pharmacy, and modern dispensing techniques. All lectures and demonstrations will be given in the college building by members of the faculty. The seminar fee, $30, includes three luncheons and a dinner, a notebook, and mimeographed notes and laboratory supplies. The dinner address, "Teamwork in the Field of Medicine," will be delivered Wednesday by Dr. Stanley P. Reimann, scientific director, Institute for Cancer Research. Details may be secured from the Registrar, Philadelphia College of Pharmacy and Science, Forty-third Street, Kingsessing and Woodland Avenues, Philadelphia 4.

Pittsburgh

Sarah Mellon Scaife Fellowship.—The 1955 Sarah Mellon Scaife Fellowship in Pathology at the University of Pittsburgh School of Medicine has been awarded to Dr. Gordon Barry Pierce of the University of Alberta Faculty of Medicine, Edmonton, Alberta, Canada. His fellowship is the second to be awarded under a $56,000 grant from the Sarah Mellon Scaife Foundation in 1953 providing for four fellowships under which the recipient spends three years in the Pitt department of pathology and the fourth at another medical center of his own selection (THE JOURNAL, Aug. 22, 1953, page 1640).

SOUTH DAKOTA

Postgraduate Medical Seminar.—The University of South Dakota School of Medical Sciences, Vermillion, has scheduled a postgraduate medical seminar April 1-2. The sessions will open at 8 p. m. Friday with presentation of "The Natural History of Thyroid Diseases: Its Practical Applications" by Dr. T. Levitt, surgeon, London, England. This meeting will be held in conjunction with the Yankton District Medical Society. Saturday at 9:15 a. m. an address of welcome will be delivered by Ila D. Weeks, LL.D., president of the University of South Dakota, after which the following program will be presented:

Natural History of Carcinoma of Uterine Cervix and of Fundus, Amos C. Michael, Vermillion.
Therapy of Carcinomas of the Uterus, Carl P. Huber, Indianapolis.
Uterine Biopsy, Fred S. Stahmann, Sioux Falls.
Bleeding During the Last Trimester of Pregnancy, Carl P. Huber, Indianapolis.
Toxemias of Pregnancy, William B. See, Columbia, Mo.

All scientific sessions will be held in the Medicine and Science Building. Luncheon and the 6:30 p. m. banquet (sponsored by the Student American Medical Association) will be held in Julian Hall on the campus. The banquet address will be delivered by Dr. Louis A. M. Krause, professor of medicine, University of Maryland School of Medicine, Baltimore. A dance will be held at 8:30 p. m. in the Union Building on the campus. Tickets ($3.50) for the annual dinner dance may be secured from the Office of the Dean, School of Medicine. The postgraduate medical seminar has been accepted for formal credit by the American Academy of General Practice.

TENNESSEE

University News.—A state bond sale in the amount of $5,250,000 has been approved to finance improvements: 2 million dollars for mental health institutions and about $2,250,000 for an expansion program at the University of Tennessee College of Medicine, Memphis.——Dr. Roy D. Schaefer, a 1950 graduate of the University of Tennessee College of Medicine, Memphis, has joined the staff of the college's division of pharmacology as an instructor.

Research Fellowships in Obstetrics.—Two Ciba research fellowships are available to qualified applicants in the division of obstetrics and gynecology, University of Tennessee College of Medicine, Memphis. The fellowships are a part of a four year residency leading toward a master of science degree in obstetrics and gynecology. After the first year, the fellowship year, during which successful applicants will work in basic research, they are expected to proceed into the clinical residency. The fellowships, which begin July 1, carry a stipend of $150 per month in addition to living quarters, food, and uniforms. Applications may be made to the Chief of the Division of Obstetrics and Gynecology, University of Tennessee College of Medicine, 894 Madison Ave., Memphis.

Surgeons Meet in Nashville.—The sectional meeting of the American College of Surgeons April 4-6 in the Dinkler-Andrew Jackson and the War Memorial Auditorium, Nashville, will feature a symposium on the management of auto accident victims, with discussions by representatives of all specialties likely to be involved. The guest speakers in addition to Tennessee surgeons will be Drs. Richard B. Cattell and Howard Ulfelder, Boston; William A. Altemeier, Cincinnati; Willard H. Parsons, Vicksburg, Miss.; John M. Waugh, Rochester, Minn.; Michael E. DeBakey, Houston, Texas; John C. Weed, New Orleans; Frederick W. Cooper Jr., Emory University, Ga.; Harris B. Shumacker Jr., Indianapolis; Frederic A. dePeyster, Chicago; Clarence E. Gardner Jr., Durham, N. C.; George E. Bennett, Baltimore; William J. Engel, Cleveland; Harry W. Hale Jr., Buffalo; Rudolf J. Noer, Louisville, Ky.; Hayes Martin, Norman L. Higinbotham, Robert H. Kennedy, and Howard C. Taylor Jr., New York; Winfield W. Scott, Rochester, N. Y.; and Robert M. Zollinger, Columbus, Ohio. Dr. Alfred Blalock, Baltimore, president, American College of Surgeons, will preside at the dinner on Tuesday, at which Dr. Paul R. Hawley, Chicago, will speak on the work of the College of Surgeons. A symposium on cancer and a panel discussion on peptic ulcer are scheduled.

TEXAS

Course on Poliomyelitis.—A demonstration of the clinical management of poliomyelitis will be given April 19-21 by Baylor University College of Medicine, Southwestern Poliomyelitis Respiratory Center, and Jefferson Davis Hospital, Houston, in cooperation with the National Foundation for Infantile Paralysis.

The course is designed for physicians, nurses, medical social workers, and physical and occupational therapists, to cover complete care of poliomyelitis. Tuition, $8.50, should accompany application to Dr. William A. Spencer, Medical Director, Southwestern Poliomyelitis Respiratory Center, Jefferson Davis Hospital, 1801 Buffalo Dr., Houston 3. Physicians and nurses requesting financial assistance for this course may apply to their local chapter of the National Foundation for Infantile Paralysis, Inc. Medical social workers, physical and occupational therapists, and any physicians and nurses whose professional responsibilities cover more than the local area should direct inquiries to the division of professional education, National Foundation for Infantile Paralysis, Inc., 120 Broadway, New York 5.

VIRGINIA

Dr. Allman Appointed Health Director.—Dr. Thomas Lee Allman, rear admiral, U. S. Navy, retired, has been appointed health director for Prince William, Fauquier, and Rappahannock counties.

WASHINGTON

Public Health Forums.—The King County Medical Society, the University of Washington School of Medicine, and the *Seattle Times* are presenting five health panels in the university's Meany Hall during March and April. The subject of the March 15 panel was "Heart Disease and Related Problems" and that of the March 22 meeting, "Emergencies in the Home." On March 29 "Emotional Problems of Adolescence" will be discussed; on April 15 the subject will be "Allergies and Related Problems"; and on April 22 the series will conclude with "New Developments in Medicine."

Cancer Symposium in Olympia.—The Thurston-Mason County Medical Society, in cooperation with the Washington division of the American Cancer Society, will offer an all day symposium on cancer at the Olympian Hotel, Olympia, April 2. Mr. James E. Spike Jr., New York, secretary of the research committee for the American Cancer Society, will be guest speaker at the evening banquet. The luncheon speaker, Dr. Fred J. Jarvis, Seattle, will discuss bronchiogenic carcinoma. Dr. John W. Settle, Olympia, will be moderator for the morning session, during which medical phases of cancer will be discussed by Drs. Edwin C. Bannick, Simeon T. Cantril, and Robert T. Potter, Seattle. Dr. George A. LeCompte, Shelton, will moderate the afternoon sessions on surgical phases of cancer, for which the speakers will be Drs. Frank Wanamaker, Thomas W. Blake, and J. Finlay Ramsay, Seattle. The final symposium of the day, "Genito-Urinary Cancer," will have Dr. Keith Cameron, Olympia, as moderator and Drs. Ole A. Nelson and Paul R. Rollins, Seattle, as speakers.

WEST VIRGINIA

Interim Meeting.—All members of the West Virginia State Medical Association are invited to attend the interim meeting of the West Virginia State Medical Association's section on neurology, neurosurgery, and psychiatry at the McClure Hotel in Wheeling, April 2, at 1:30 p. m.

Surgeons Meet at White Sulphur Springs.—The annual meeting of the West Virginia chapter of the American College of Surgeons will be held at the Greenbrier, White Sulphur Springs, March 25-26 under the presidency of Dr. T. Kerr Laird, Montgomery. Two sound motion pictures, "Surgery for Massive Hemorrhage from Gastroduodenal Ulcer" and "Operative Treatment for Hirschsprung's Disease," will be shown at a cine clinic at 9 a. m. Friday, after which papers on the management of acute cholecystitis and on surgical treatment of funnel chest will be followed by a panel discussion, "Surgery of Peptic Ulcer." The afternoon program will feature the following addresses: "Nonpenetrating Abdominal Trauma"; "Two Interesting Cases of Intestinal Obstruction"; and "A Cancer Registry." The Saturday morning session will consist of a cine clinic, "Cancer of the Female Breast" and "Hernioplasty"; the presentation of papers "The Normal Appendix v. the Tissue Committee" and "Treatment of Acute Head Injuries"; and a panel discussion, "Management of Industrial Back Injuries." There will be a social hour for members and their wives on Friday, at 6 p. m.

WISCONSIN

Gynecological Meeting.—At its meeting, March 28, 8 p. m., in the Wisconsin Club the Milwaukee Gynecological Society will hear Dr. Andrew A. Marchetti, professor of obstetrics and gynecology, Georgetown University Medical Center, Georgetown University, Washington, D. C., present "Vesico-Urethral Suspension—A Ten Year Survey."

Meeting on Child Psychiatry.—The Madison Pediatric Society will present a lecture on "The Relationship Between Child Psychiatry and Internal Medicine" by Dr. Robert L. Faucett, consultant, section on psychiatry, Mayo Clinic, Rochester, Minn., at 8 p. m., March 29, in the auditorium, Service Memorial Institute, Madison.

Lecture by British Anatomist.—Dr. J. Dixon Boyd, professor of anatomy, Cambridge University, Cambridge, England, will lecture before the Medical School Society of the University of Wisconsin Medical School, Madison, at 8 p. m., March 28, in the auditorium, Service Memorial Institute. His subject will be "Pigment Cells and Their Significance in Human Embryos."

GENERAL

Stimson Fellowship in Biochemistry.—The Scripps Metabolic Clinic announces that applications for the Charles Willard Stimson Fellowship, its postdoctoral fellowship in biochemistry, are being accepted. This fellowship, available each year, carries a stipend of $5,000. Applications should be sent to the Scripps Metabolic Clinic, La Jolla, Calif., before May 1.

Cosmetic Chemists Offer Prize.—The Society of Cosmetic Chemists (2 E. 63rd St., New York 21) has instituted an award of $1,000 for "that recent contribution to the scientific literature which is judged to be of the greatest potential value to the improvement of cosmetic technology." The literature review committee invites submission of papers published in original and in abstract form between Jan. 1, 1953, and Dec. 31, 1954. Papers published as theses, which have not appeared in any periodical, are also eligible.

Histochemical Society Meets in Philadelphia.—The Histochemical Society will meet at Jefferson Medical College, Philadelphia, April 4-5, with headquarters in the Hotel Benjamin Franklin. A symposium, "Histochemistry and the Elucidation of Kidney Structure and Function," Tuesday afternoon, will include papers on histochemical staining reactions in normal and abnormal kidneys, the role of mitochondria in electrolyte transport, histochemical characteristics of absorption droplets in nephrons, and electron microscopy in relation to renal function.

Biological Chemistry Program.—At the meeting of the American Chemical Society in Cincinnati March 29-April 7, the division of medicinal chemistry will present a symposium on newer hypotensive drugs and methods of screening, Thursday morning, and a symposium on diuretics on Friday afternoon. The division of biological chemistry has scheduled the following symposiums: Progress with Biochemistry of Cancer, Dynamic Interrelationships of Bone, and Biological Phosphate Transfer and Uptake Mechanisms. The program of this division Wednesday morning will contain discussions on cancer, including "Structural Similarities of Carcinogenic Substances" and "The Chemistry of Tobacco Smoke: Petroleum Ether-Solubles."

Examination of Orthoptic Technicians.—The annual examination of orthoptic technicians by the American Orthoptic Council will be conducted in August and October. The written examination, nonassembled, will take place Aug. 25 in certain offices and will be proctored by designated ophthalmologists. The oral and practical examinations will be held on Oct. 8 in Chicago, just preceding the meeting of the American Academy of Ophthalmology and Otolaryngology. Application for examination will be received by the office of the Secretary of the American Orthoptic Council, Dr. Frank D. Costenbader, 1605 22nd St., N. W., Washington 8, D. C., and must be accompanied by the examination fee of $30. Applications will not be accepted after July 1.

Changes in CARE Package Program.—CARE, a nonprofit body, made up of 26 American relief, religious, labor, and cooperative organizations that since 1946 have sent over 10 million gift packages to residents in Western Europe and Great Britain, announces the following changes in its program. Effective April 8, CARE's Designated Package Program will be discontinued in the following countries only: Austria, Belgium, France, Great Britain, Netherlands, Luxemburg, Norway, and West Germany. CARE will continue to maintain its operations in Berlin, the East Zone of Germany, Finland, Greece, India, Israel, Italy, Japan, Korea, Okinawa, Pakistan, the Philippines, and Yugoslavia. Information may be obtained from CARE Headquarters, 660 First Ave., New York 16.

New Blakeslee Award Deadline.—May 1 has been set as the new deadline date for submission of entries for the American Heart Association's third annual Howard W. Blakeslee awards for outstanding scientific reporting in the field of cardiovascular disease. Material published or produced in the fields of newspapers, magazines, books, radio, television, and films between Jan. 1, 1954, and March 1, 1955, will be eligible for the 1955 awards. In previous years, the Blakeslee entry deadline has been Jan. 15, and the eligibility period has coincided with the preceding calendar year. The changes this year stem from the deferment of the association's annual meeting from spring to fall, with the 1955 awards scheduled for presentation at the annual dinner. The annual meeting will be held at the Jung Hotel in New Orleans, Oct. 22-27.

New Journal on Antibiotic Therapy.—A new journal, *Antibiotic Medicine: Journal of Clinical Studies and Practice of Antibiotic Therapy*, is being published by MD Publications, Inc., 30 E. 60th St., New York 22. The first issue, the January number, contains a statement of purpose by Henry Welch, Ph.D., editor-in-chief, and Dr. Félix Martí-Ibáñez, who launched the *Journal of Antibiotics and Chemotherapy* four years ago. The editors point out that, being obliged to concentrate exclusively on laboratory problems and research, there arose a need for an exclusively clinical journal, dedicated to the diffusion of progress made in antibiotic therapy. The new journal aspires to present facts, ideas, news, and interpretations of things that occur in the world of antibiotic medicine. The journal invites the collaboration of all men of science, theoretically or practically interested in antibiotic medicine.

Microcirculatory Conference.—The second Microcirculatory Conference for Physiology and Pathology will convene at the Benjamin Franklin Hotel, Philadelphia, April 5, under the sponsorship of the American Association of Anatomists, to discuss "Vascular Patterns as Related to Function." The following topics have been scheduled:

Selective Distribution of Blood Through the Terminal Vascular Bed of Mesenteric Structures and Skeletal Muscle.
Vascular Patterns and Active-Vasomotion as Determiners of Flow Through Minute Vessels.
Vascular Patterns in Tissues and Grafts Within Transparent Chambers in Mice.
Vascular Patterns in the Endometrium.
In Vivo Microscopic Vascular Anatomy and Physiology of the Liver as Determined by Quartz-Rod Transillumination.
Microcirculation of the Spleen of the Mouse.
Capillary Bed in the Human Conjunctiva.
Vascular Patterns of the Cochlear Circulation Related to Function.

A social period at 6:30 will precede dinner.

Anesthesiologists Meet in Boston.—Dr. Henry K. Beecher, Boston, will serve as chairman of the meeting of the New England Society of Anesthesiologists in Boston, April 1. The afternoon session in the Bigelow Amphitheatre, Massachusetts General Hospital, will open at 2:30 with "Cardiac Arrest at the Massachusetts General Hospital: 1924-1954" by Dr. Bernard D. Briggs, Boston, after which "Physiologic Interrelationship Between the Thyroid and the Adrenal Medulla During Anesthesia" will be presented by Dr. William R. Brewster Jr., Boston; "Reaction to Sensation as the Effective Site for Drug Action," by Dr. Beecher; and "Citric Acid Intoxication During Massive Blood Transfusions," by Dr. John J. Bunker, Boston. Cocktails from 5 to 6 p. m. and dinner will precede the evening session in the library of the Harvard Club, where "The Diagnosis and Treatment of Difficult Pain Problems" will be discussed by Dr. James C. White, associate professor of surgery, Harvard Medical School, and chief, department of neurosurgery, Massachusetts General Hospital.

Society News.—At the annual meeting of the **American Academy of Allergy** Dr. Stanley F. Hampton, St. Louis, was elected president; Dr. Carl E. Arbesman, Buffalo, president-elect; Dr. Abraham Colmes, Boston, vice-president; Dr. Francis C. Lowell, Boston, secretary; and Dr. Max Samter, Chicago, treasurer.——Officers of the **Association of Medical Illustrators** for 1954-1955 include: president, Mr. Philip A. Conrath, St. Louis University School of Medicine, 1402 S. Grand Blvd., St. Louis 4, and corresponding secretary, Miss Rose M. Reynolds, University of Nebraska College of Medicine, 42nd and Dewey avenues, Omaha 5.——At the annual meeting of the **American Academy of Dermatology and Syphilology,** Dec. 6, 1954, the following officers were elected: Dr. Arthur C. Curtis, Ann Arbor, Mich., president; Dr. Carroll S. Wright, Philadelphia, vice-president; Dr. James R. Webster, Chicago, secretary-treasurer; and Dr. Robert R. Kierland, Rochester, Minn., assistant secretary-treasurer.——Newly elected officers of the **Mississippi Valley Medical Society** include: Dr. Frank R. Peterson, Cedar Rapids, Iowa, president-elect; Drs. Joseph C. Edwards, St. Louis, Arkell M. Vaughn, Chicago, and Rubin H. Flocks, Iowa City, vice-presidents; Dr. Harold Swanberg, Quincy, Ill., secretary-treasurer; and Dr. Jacob E. Reisch, Springfield, Ill., assistant secretary-treasurer. Dr. Arthur S. Bristow, Princeton, Mo., is the 1955 president.

Pediatricians Meet in Detroit.—The American Academy of Pediatrics will meet at the Sheraton-Cadillac Hotel and Hotel Statler, Detroit, April 4-7. The sessions will open at 9:30 a. m. Monday, with an address of welcome by Dr. A. Crawford Bost, San Francisco, president. Dr. James L. Wilson, Ann Arbor, Mich., will serve as moderator for a symposium on resuscitation of the newborn infant at 2 p. m. Monday. Dr. Warren E. Wheeler, Columbus, Ohio, will moderate the Tuesday morning symposium on diarrhea and other nursery infections, and Dr. Robert F. Ziegler, Detroit, will be moderator for the afternoon panel on congenital heart disease, during which physiological studies, angiocardiography, and electrocardiography will be discussed. Questions for this panel on diagnostic procedures are invited and may be mailed in advance of the meeting to the Chairman of the Program Committee, Dr. Joseph A. Johnston, Henry Ford Hospital, Detroit 2. The Wednesday afternoon session will begin with presentation of a plaque to the Harper Hospital Library in commemoration of the founders' meeting of the American Academy of Pediatrics. Thursday morning will be devoted to clinical sessions at Children's Hospital, Harper Hospital, and Henry Ford Hospital in Detroit and the University of Michigan hospital in Ann Arbor. The new Memorial Maternity Center of the Woman's Hospital (Forest and Beaubien Streets, Detroit) will be open for inspection Tuesday at 12 noon. A buffet luncheon will be served. Advance registration is necessary.

FOREIGN

Course on Renal Pathology.—The University of Paris College of Medicine Department of Propadeutic Clinical Medicine, Broussais Hospital (Prof. Pasteur Vallery-Radot) announces a postgraduate medical course in renal pathology May 9-11. The first day will be devoted to renal and ureteral lithiasis, the second to congenital diseases of the kidneys and routes of excretion in adults and children, and the third to disturbances in renal vascularization and recent discoveries in nephropathy. Registration fee (3,000 francs, about $8.70) should be sent to Clinique Médicale Propédeutique, Hôpital Broussais, 96, rue Didot, Paris 14.

French Courses in Gastroenterology.—The Bureau of the Curriculum of Higher Education in Digestive Pathology, which was organized under the sponsorship of the College of Medicine of Paris and the French National Society of Gastroenterology, announces the following series of lectures and practical demonstrations: Liver and Pancreas (May 16-28); Esophagus, Stomach, and Duodenum (June 1-14); Intestine, Rectum, and Anus (June

15-25). The demonstrations will include laboratory tests, radiographic and endoscopic examination, and clinical examination. A program will be sent on request addressed to Dr. F. Moutier, Secretary of the Curriculum, 78, rue de Monceau, Paris 8, France.

Congress of Obstetrics and Gynecology.—The fifth Hispano-Portuguese Congress of Obstetrics and Gynecology will be held April 13-16 in Seville, Spain, under the auspices of the General Department of Public Health and the General Council of Medical Colleges. The official topics will be (for the Portuguese section) physiopathology of the lower uterine segment and (for the Spanish section) puberty. Papers will be presented on the morphological evolution of women in puberty; endocrinology of puberty; psychology of puberty; and clinic of puberty. Information can be obtained from the General Secretary, Dr. M. Recasens, Calle Munoz Olive 7, Seville, Spain.

Residency Posts.—The Indian Medical Association requests offers from recognized hospitals for residency posts in all specialties for physicians from India (men and women), specially selected for graduate training in hospitals in the United States. These physicians will have a good command of spoken and written English. The hospitals must be approved by the U. S. State Department for the exchange-visitor program. Interested hospitals are requested to communicate by air mail with the Honorary Secretary, Indian Medical Association, "Hanging Bridge," Daryaganj, Delhi 7 (India), giving offers of posts, terms of appointment, etc., including maintenance, stipend, and also the allotted number for the exchange-visitor program.

Seminar Congresses in Obstetrics and Gynecology.—In its seminar congresses in obstetrics and gynecology the American Medical Society of Vienna will present the following programs by the medical faculty of the University of Vienna:

April 21-23, Vaginal Operative Approach of Pelvis.
May 19-21, Gynecological Pathology; Gynecological Endocrinology; Gynecological Cytology.
June 23-25, Manikin Obstetrics.
July 21-23, Gynecology; Oncology; Female Urology.
Aug. 25-27, Sterility; Fertility; Hormone Therapy.
Sept. 22-24, Surgical Obstetrics; Manikin Obstetrics; Operative Gynecology.
Oct. 27-29, Gynecologic Surgery; Wertheim Approach; Obstetrical Surgery.

Details may be obtained from the American Medical Society of Vienna, I. Vienna, Universitaetsstrasse 11. Cable, "Ammedic" Vienna.

Congress of Comparative Pathology.—The seventh International Congress of Comparative Pathology will be held at the Institut d'Anatomie Pathologique, Lausanne, Switzerland, May 26-31. The program will include papers and discussions on viral infections transmitted to man by animals, pathological and hygienic aspects of atmospheric pollution problems, and growth disturbances in comparative pathology. Official languages of the congress will be French, English, German, Italian, Spanish, and Russian. A technical exhibit will be provided, and visits to scientific institutions will be made. Postcongress tours from two to five days in Switzerland are planned. Titles and texts of communications must be submitted not later than May 1 to the General Secretary of the Seventh International Congress of Comparative Pathology, 19 rue César-Roux, Lausanne, Switzerland. Requests for the program and inquiries concerning registration should be addressed to the General Secretary, or to Lee M. Hutchins, Chairman, United States Section (Chief, Division of Forest Disease Research, Forest Service, U. S. Department of Agriculture, Washington 25, D. C.).

CORRECTIONS

Streptomycin and Nontuberculous Infections.—In the Query and Minor Note by this title in THE JOURNAL, Feb. 26, 1955, page 778, in the eighth line of the first answer, the word "cervical" should have read "cranial."

Milk Allergy.—In the Query and Minor Note by this title in the Jan. 29, 1955 issue of THE JOURNAL, page 485, in the second paragraph of the answer, the first two words in line 13 should read "food allergy" instead of "milk allergy."

MEETINGS

AMERICAN MEDICAL ASSOCIATION: Dr. George F. Lull, 535 North Dearborn St., Chicago 10, Secretary.

1955 Annual Meeting, Atlantic City, N. J., June 6-10.

1955 Clinical Meeting, Boston, Nov. 29-Dec. 2.

1956 Annual Meeting, Chicago, June 11-15.

1956 Clinical Meeting, Seattle, Nov. 27-30.

1957 Annual Meeting, New York, June 3-7.

ALABAMA, MEDICAL ASSOCIATION OF THE STATE OF, Whitley Hotel, Montgomery, April 21-23. Dr. Douglas L. Cannon, 537 Dexter Ave., Montgomery, Secretary.

AMERICAN ACADEMY OF GENERAL PRACTICE, Los Angeles, March 28-31. Mr. Mac F. Cahal, 406 West 34th St., Kansas City, Mo., Executive Secretary.

AMERICAN ACADEMY OF NEUROLOGY, Shamrock Hotel, Houston, Tex., April 28-30. Dr. Alexander T. Ross, Indiana University Medical Center, Indianapolis 7, Secretary.

AMERICAN ACADEMY OF PEDIATRICS, Spring Session, Sheraton-Cadillac Hotel, Detroit, April 4-7. Dr. E. H. Christopherson, 610 Church St., Evanston, Ill., Executive Secretary.

AMERICAN ASSOCIATION OF ANATOMISTS, Philadelphia, April 6-8. Dr. N. L. Hoerr, 2109 Adelbert Rd., Cleveland 6, Secretary.

AMERICAN ASSOCIATION FOR CLEFT PALATE REHABILITATION, Statler Hotel, Boston, May 13-14. Dr. Jack Matthews, 1617 Cathedral of Learning, University of Pittsburgh, Pittsburgh 13, Secretary.

AMERICAN ASSOCIATION FOR HEALTH, PHYSICAL EDUCATION AND RECREATION, Hotel Statler, Boston, April 17-20. Mr. William F. Meredith, Dept. of Physical Education, University of Pennsylvania, Philadelphia 4, Secretary.

AMERICAN ASSOCIATION OF THE HISTORY OF MEDICINE, Hotel Park Shelton, Detroit, May 12-14. Dr. Samuel X. Radbill, 7043 Elmwood Ave., Philadelphia 42, Secretary.

AMERICAN ASSOCIATION OF IMMUNOLOGISTS, San Francisco, April 10-16. Dr. F. S. Cheever, University of Pittsburgh School of Public Health, Pittsburgh 13, Secretary.

AMERICAN ASSOCIATION OF PATHOLOGISTS AND BACTERIOLOGISTS, The Shamrock, Houston, Texas, April 7-9. Dr. Edward A. Gall, Cincinnati General Hospital, Cincinnati 29, Secretary.

AMERICAN ASSOCIATION OF RAILWAY SURGEONS, Drake Hotel, Chicago, April 12-14. Dr. Chester C. Guy, 5800 Stony Island Ave., Chicago 37, Secretary.

AMERICAN ASSOCIATION FOR THE STUDY OF NEOPLASTIC DISEASES, Lord Baltimore Hotel, Baltimore, May 5-7. Dr. Bruce H. Sisler, P. O. Box 268, Gatlinburg, Tenn., Secretary.

AMERICAN ASSOCIATION FOR THORACIC SURGERY, Chalfonte-Haddon Hall, Atlantic City, N. J., April 24-26. Dr. Paul C. Samson, 3959 Happy Valley Rd., Lafayette, Calif., Secretary.

AMERICAN COLLEGE OF ALLERGISTS, Morrison Hotel, Chicago, April 25-30. Dr. Fred W. Wittich, 401 LaSalle Med. Bldg., Minneapolis 2, Secretary.

AMERICAN COLLEGE OF CARDIOLOGY, Hotel Biltmore, New York, May 19-21. Dr. Philip Reichert, 140 West 57th St., New York 19, Secretary.

AMERICAN COLLEGE OF PHYSICIANS, Benjamin Franklin and Bellevue-Stratford Hotels, Philadelphia, April 25-29. Mr. E. R. Loveland, 4200 Pine St., Philadelphia 4, Executive Secretary.

AMERICAN DERMATOLOGICAL ASSOCIATION, Bellevue-Biltmore Hotel, Belleair, Fla., April 17-21. Dr. J. Lamar Callaway, Duke Hospital, Durham, N. C., Secretary.

AMERICAN FEDERATION FOR CLINICAL RESEARCH, Haddon Hall, Atlantic City, N. J., May 1. Dr. Lawrence E. Hinkle Jr., 525 East 68th St., New York 21, Secretary.

AMERICAN GERIATRICS SOCIETY, Hotel Roosevelt, New York, April 21-22. Dr. Malford W. Thewlis, 25 Mechanic St., Wakefield, R. I., Secretary.

AMERICAN GOITER ASSOCIATION, Skirvin Hotel, Oklahoma City, April 28-30. Dr. John C. McClintock, 149½ Washington Ave., Albany 10, N. Y., Secretary.

AMERICAN PHYSIOLOGICAL SOCIETY, San Francisco, April 11-16. Dr. W. F. Hamilton, Medical College of Georgia, Augusta, Ga., Secretary.

AMERICAN PSYCHIATRIC ASSOCIATION, Traymore and Claridge Hotels, Atlantic City, N. J., May 9-13. Dr. William Malamud, 80 East Concord St., Boston 18, Secretary.

AMERICAN PSYCHOSOMATIC SOCIETY, Claridge Hotel, Atlantic City, N. J., May 4-5. Dr. Theodore Lidz, 333 Cedar St., New Haven 11, Conn., Secretary.

AMERICAN RADIUM SOCIETY, Shoreham Hotel, Washington, D. C., April 21-23. Dr. Robert E. Fricke, 102 Second Ave. S.W., Rochester, Minn., Secretary.

AMERICAN SOCIETY OF BIOLOGICAL CHEMISTS, Palace Hotel, San Francisco, Apr. 10-15. Dr. Philip Handler, Duke University, Durham, N. C., Secretary.

AMERICAN SOCIETY FOR CLINICAL INVESTIGATION, Haddon Hall, Atlantic City, N. J., May 2. Dr. J. D. Meyers, 622 West 168th St., New York 32, Secretary.

AMERICAN SOCIETY FOR EXPERIMENTAL PATHOLOGY, San Francisco, April 10-16. Dr. Cyrus C. Erickson, 874 Union Avenue, Memphis 3, Tenn., Secretary.

AMERICAN SOCIETY OF MAXILLOFACIAL SURGEONS, Brown Hotel, Louisville, Ky., May 9-11. Dr. John A. Drummond, 1414 Drummond St., Montreal, Canada, Secretary

AMERICAN SOCIETY FOR PHARMACOLOGY AND EXPERIMENTAL THERAPEUTICS, San Francisco, April 10-16. Dr. Carl C. Pfeiffer, Emory University School of Medicine, Emory University, Ga., Secretary.

AMERICAN SURGICAL ASSOCIATION, The Warwick, Philadelphia, April 27-29. Dr. R. Kennedy Gilchrist, 59 East Madison St., Chicago 3, Secretary.

AMERICAN UROLOGICAL ASSOCIATION, Hotel Biltmore, Los Angeles, May 16-19. Dr. Charles H. deT. Shivers, 121 South Illinois Ave., Atlantic City, N. J., Secretary.

AMERICAN VENEREAL DISEASE ASSOCIATION, Washington, D. C., Apr. 28-29. Dr. John C. Hume, 615 N. Wolfe St., Baltimore 5, Secretary.

ARIZONA MEDICAL ASSOCIATION, El Conquistador, Tucson, May 4-7. Dr. Dermont W. Melick, 401 Security Building, Phoenix, Secretary.

ASSOCIATION OF AMERICAN PHYSICIANS, Chalfonte-Haddon Hall, Atlantic City, N. J., May 3-4. Dr. W. Barry Wood Jr., 600 S. Kingshighway Blvd., St. Louis 10, Secretary.

CALIFORNIA MEDICAL ASSOCIATION, Palace Hotel, San Francisco, May 1-5. Mr. John Hunton, 450 Sutter St., San Francisco 8, Executive Secretary.

CATHOLIC HOSPITAL ASSOCIATION OF THE U. S. AND CANADA, Kiel Auditorium, St. Louis, May 16-19. Mr. M. R. Kneifl, 1438 South Grand Blvd., St. Louis 4, Executive Secretary.

CONFERENCE ON MICROCIRCULATORY PHYSIOLOGY AND PATHOLOGY, Benjamin Franklin Hotel, Philadelphia, April 5. Dr. George P. Fulton, Boston University College of Liberal Arts, 725 Commonwealth Ave., Boston 15, Chairman.

CONNECTICUT STATE MEDICAL SOCIETY, Stratfield Hotel, Bridgeport, April 26-28. Dr. Creighton Barker, 160 St. Ronan St., New Haven, Executive Secretary.

EASTERN STATES HEALTH EDUCATION CONFERENCE, New York Academy of Medicine, New York, April 21-22. Dr. Iago Galdston, 2 East 103rd St., New York 29, Secretary.

FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, San Francisco, April 11-15. Dr. M. O. Lee, 2101 Constitution Avenue, Washington, D. C., Secretary.

FLORIDA MEDICAL ASSOCIATION, Vinoy Park Hotel, St. Petersburg, April 3-6. Dr. Samuel M. Day, P. O. Box 1018, Jacksonville, Secretary.

GEORGIA, MEDICAL ASSOCIATION OF, Bon Air Hotel, Augusta, May 1-4. Mr. Milton D. Kreuger, 875 West Peachtree St., Atlanta, Executive Secretary.

HAWAII MEDICAL ASSOCIATION, Honolulu, May 5-8. Dr. Samuel L. Yee, 510 South Beretania St., Honolulu 13, Secretary.

ILLINOIS STATE MEDICAL SOCIETY, Hotel Sherman, Chicago, May 17-20. Dr. Harold M. Camp, 224 South Main St., Monmouth, Secretary.

INDUSTRIAL MEDICAL ASSOCIATION, Buffalo, N. Y., April 23-29. Dr. Glenn Gardiner, Inland Steel Co., East Chicago, Ind., Secretary.

IOWA STATE MEDICAL SOCIETY, Veterans' Memorial Auditorium, Des Moines, April 24-27. Dr. R. F. Birge, 529 36th St., Des Moines 12, Secretary.

JOHN A. ANDREW CLINICAL SOCIETY, Memorial Hospital, Tuskegee Institute, Ala., April 3-8. Dr. Eugene H. Dibble Jr., John A. Andrew Memorial Hospital, Tuskegee Institute, Alabama, Secretary.

KANSAS MEDICAL SOCIETY, Baker Hotel, Hutchinson, May 1-5. Dr. J. A. Butin, 315 West Fourth St., Topeka, Secretary.

LOUISIANA STATE MEDICAL SOCIETY, Roosevelt Hotel, New Orleans, May 2-4. Dr. C. Grenes Cole, 1430 Tulane Ave., New Orleans 12, Secretary.

MARYLAND, MEDICAL AND CHIRURGICAL FACULTY OF THE STATE OF, Baltimore, April 21-23. Dr. Everett S. Diggs, 1211 Cathedral St., Baltimore, Secretary.

MASSACHUSETTS MEDICAL SOCIETY, Hotel Statler, Boston, May 17-19. Dr. Robert W. Buck, 22 Fenway, Boston 15, Secretary.

MEDICAL LIBRARY ASSOCIATION, Hotel Schroeder, Milwaukee, May 17-20. Miss Esther Judkins, Rockefeller Institute, 66th St. at York Ave., New York 21, Secretary.

MID-CENTRAL STATES ORTHOPAEDIC SOCIETY, Sheraton Hotel and St. Louis Medical Society Auditorium, St. Louis, April 15-16. Dr. H. O. Anderson, 3244 East Douglas St., Wichita, Kans., Secretary.

MIDWEST REGIONAL CONFERENCE, AMERICAN PSYCHIATRIC ASSOCIATION, Nebraska Psychiatric Institute, Omaha, Apr. 22-23. Dr. Harold R. Martin, Nebraska Psychiatric Institute, Omaha, Chairman, Program Committee.

MISSISSIPPI STATE MEDICAL ASSOCIATION, Hotel Buena Vista, Biloxi, May 10-12. Mr. Rowland B. Kennedy, 860 Milner Bldg., Jackson, Executive Secretary.

MISSOURI STATE MEDICAL ASSOCIATION, Kansas City, March 27-30. Dr. E. R. Bohrer, 634 North Grand Blvd., St. Louis 3, Secretary.

NATIONAL GASTROINTESTINAL CANCER CONFERENCE, Hosack Hall, New York Academy of Medicine, New York, April 4-5. Dr. Morris K. Barrett, National Cancer Institute, Bethesda 14, Maryland, Executive Secretary.

NEBRASKA STATE MEDICAL ASSOCIATION, Hotel Paxton, Omaha, May 16-19. Dr. R. B. Adams, 1315 Sharp Bldg., Lincoln, Secretary.

NEW JERSEY, MEDICAL SOCIETY OF, Ambassador Hotel, Atlantic City, April 17-20. Dr. Marcus H. Greifinger, 315 West State St., Trenton 8, Secretary.

NEW MEXICO MEDICAL SOCIETY, Hilton Hotel, Albuquerque, May 4-6. Mr. Ralph R. Marshall, 223 First National Bank Bldg., Albuquerque, Executive Secretary.

NEW YORK, MEDICAL SOCIETY OF THE STATE OF, Hotel Statler, Buffalo, May 9-13. Dr. Walter P. Anderton, 386 Fourth Avenue, New York 16, Secretary.

NORTH CAROLINA, MEDICAL SOCIETY OF THE STATE OF, Hotel Carolina, Pinehurst, May 2-4. Mr. James T. Barnes, 203 Capitol Club Building, Raleigh, Executive Secretary.

NORTH DAKOTA STATE MEDICAL ASSOCIATION, Hotel Prince, Bismarck, April 30-May 3. Dr. E. H. Boerth, Box 1198, Bismarck, Secretary.

OHIO STATE MEDICAL ASSOCIATION, Netherland-Plaza Hotel, Cincinnati, April 19-21. Mr. Charles S. Nelson, 79 E. State St., Columbus 15, Executive Secretary.

OKLAHOMA STATE MEDICAL ASSOCIATION, Mayo Hotel, Tulsa, May 8-11. Mr. R. H. Graham, 1227 Classen Drive, Oklahoma City, Executive Secretary.

PACIFIC NORTHWEST SOCIETY OF PLASTIC AND RECONSTRUCTIVE SURGEONS, Spokane, Wash., May 21. Dr. E. E. Banfield, Medical Arts Bldg., Tacoma 2, Washington, Secretary.

POST GRADUATE INSTITUTE OF THE PHILADELPHIA COUNTY MEDICAL SOCIETY, Bellevue-Stratford Hotel, Philadelphia, March 29-April 1. Dr. Leandro M. Tocantino, 301 South 21st St., Philadelphia 3, Director.

RHODE ISLAND MEDICAL SOCIETY, Rhode Island Medical Society Library, Providence, May 4-5. Dr. Thomas Perry Jr., 106 Francis St., Providence 3, Secretary.

SECTIONAL MEETINGS, AMERICAN COLLEGE OF SURGEONS:

IDAHO, Sun Valley, Sun Valley Lodge, April 18-20. Dr. James H. Hawley, 105 North 8th St., Boise, Chairman.

MANITOBA, Winnipeg, The Fort Garry, April 25-26. Dr. Paul H. T. Thorlakson, Winnipeg Clinic, Winnipeg, Manitoba, Chairman.

TENNESSEE, Nashville, Dinkler-Andrew Jackson Hotel and War Memorial Bldg., April 4-6. Dr. James A. Kirtley Jr., 104 Twentieth Ave. North, Nashville, Chairman.

SOCIETY OF AMERICAN BACTERIOLOGISTS, Statler Hotel, New York, May 8-13. Dr. John Hays Bailey, Sterling Winthrop Research Institute, Rensselaer, N. Y., Secretary.

SOUTH CAROLINA MEDICAL ASSOCIATION, Francis Marion Hotel, Charleston, May 10-12. Dr. Robert Wilson, 165 Rutledge Ave., Charleston, Secretary.

SOUTH DAKOTA STATE MEDICAL ASSOCIATION, Lawler Hotel, Mitchell, May 21-24. Dr. G. I. W. Cottam, 300 First National Bank Bldg., Sioux Falls, Secretary.

SOUTHERN BRANCH, AMERICAN PUBLIC HEALTH ASSOCIATION, New Orleans, May 11-13. Dr. Frank M. Hall, P. O. Box 491, Gainesville, Fla., Secretary.

STUDENT AMERICAN MEDICAL ASSOCIATION, Sherman Hotel, Chicago, May 6-8. Mr. Russell F. Staudacher, 510 N. Dearborn St., Chicago 10, Executive Secretary.

TENNESSEE STATE MEDICAL ASSOCIATION, Read House, Chattanooga, April 10-13. Dr. R. H. Kampmeier, 706 Church St., Nashville 3, Secretary.

TEXAS MEDICAL ASSOCIATION, Texas Hotel, Fort Worth, April 24-27. Dr. J. M. Travis Sr., 1801 North Lamar Blvd., Austin, Secretary.

UNITED STATES-MEXICO BORDER PUBLIC HEALTH ASSOCIATION, Hotel del Bosque, Mexico, D. F., May 6-9. Dr. Sidney B. Clark, 204 U. S. Court, El Paso, Texas, Secretary.

WESTERN BRANCH, AMERICAN PUBLIC HEALTH ASSOCIATION, Phoenix, Ariz., April 19-22. Mrs. L. Amy Darter, Division of Laboratories, State Dept. of Public Health, Berkeley, Calif., Secretary.

WESTERN INDUSTRIAL MEDICAL ASSOCIATION, Sir Francis Drake Hotel, San Francisco, April 30. Dr. Edward J. Zaik, 740 S. Olive St., Room 320, Los Angeles 14, Secretary.

WISCONSIN, STATE MEDICAL SOCIETY OF, Hotel Schroeder, Milwaukee, May 3-5. Mr. Charles H. Crownhart, 704 East Gorham St., Madison 3, Secretary.

FOREIGN AND INTERNATIONAL

ASSOCIATION OF SURGEONS OF GREAT BRITAIN AND IRELAND, University of Glasgow, Glasgow, Scotland, April 14-16. Dr. Henry W. S. Wright, 45 Lincoln's Inn Fields, London W.C.2, England, Hon. Secretary.

AUSTRALASIAN MEDICAL CONGRESS, Sydney, N.S.W., Australia, Aug. 20-27. For information write: Federal Council of the B.M.A. in Australia, 135 Macquaire St., Syndey, N.S.W., Australia.

BRITISH MEDICAL ASSOCIATION, Representative Meeting, London, England, June 1-4. Dr. A. Macrae, B.M.A. House, Tavistock Square, London, W.C.1, England, Secretary.

CANADIAN AND BRITISH MEDICAL ASSOCIATIONS, Joint Meeting, Toronto, Canada, June 20-22. Dr. Arthur D. Kelly, 244 St. George St., Toronto, Canada, General Secretary.

COMMONWEALTH HEALTH AND TUBERCULOSIS CONFERENCE, Royal Festival Hall, London, England, June 21-25. Mr. J. H. Harley Williams, Tavistock House North, Tavistock Square, London, W.C.1, England, Secretary General.

CONGRESS OF INTERNATIONAL ASSOCIATION OF APPLIED PSYCHOLOGY, London, England, July 18-23. Dr. C. B. Frisby, National Institute of Industrial Psychology, 14 Welbeck St., London, W.1, England, President.

CONGRESS OF INTERNATIONAL ASSOCIATION OF PSYCHOTECHNOLOGY, London, England, July 18-23. For information write: Dr. C. B. Frisby, Director, National Institute of Industrial Psychology, 14 Welbeck St., London, W.1, England.

CONGRESS OF THE INTERNATIONAL ASSOCIATION FOR THE STUDY OF THE BRONCHI, Stockholm, Sweden, June 18-19. For information write: Dr. J. M. Lemoine, 187 boulevard St. Germain, Paris 7e, France.

CONGRESS OF INTERNATIONAL DIABETES FEDERATION, Cambridge, England, July 4-8. Mr. James G. L. Jackson, 152 Harley St., London, W.1, England, Executive Secretary General.

CONGRESS OF INTERNATIONAL SOCIETY OF SURGERY, Copenhagen, Denmark, July 23-29. Dr. L. Dejardin, 141 rue Belliard, Brussels, Belgium, General Secretary.

EUROPEAN CONGRESS ON RHEUMATISM, Scheveningen, The Hague, Netherlands, June 13-17. Dr. H. van Swaay, Pieter Bothstraat 12, The Hague, Netherlands, Secretary.

HEALTH CONGRESS OF THE ROYAL SANITARY INSTITUTE, Bournemouth, England, April 26-29. Mr. P. Arthur Wells, Royal Sanitary Institute, 90 Buckingham Palace Road, London, S.W.1, England, Secretary.

HISPANO-PORTUGUESE CONGRESS OF OBSTETRICS AND GYNECOLOGY, Seville, Spain, April 13-16. Dr. M. Recasens, Calle Munoz Olive 7, Seville, Spain, General Secretary.

INTER-AMERICAN CONGRESS OF RADIOLOGY, Shoreham Hotel, Washington, D. C., U. S. A., April 24-29. Dr. Eugene P. Pendergrass, 3400 Spruce St., Philadelphia 4, Pa., U. S. A., Secretary General.

INTERNATIONAL ANATOMICAL CONGRESS, Paris, France, July 25-30. Prof. Gaston Cordier, 45, rue des Saints-Pères, Paris 6e, France, Secretary General.

INTERNATIONAL CONGRESS OF ALLERGOLOGY, Rio de Janeiro, Brazil, S. A., Nov. 6-12. Dr. Bernard N. Halpern, 197 boulevard St. Germain, Paris 7e, France, Secretary General.

INTERNATIONAL CONGRESS OF ANGIOLOGY AND HISTOPATHOLOGY, Fribourg, Switzerland, Sept. 2-5. For information write: Dr. Gerson, 4 rue Pasquier, Paris 8e, France.

INTERNATIONAL CONGRESS OF BIOCHEMISTRY, Brussels, Belgium, Aug. 1-6. Prof. C. Liebecq, 17 Place Delcour, Liège, Belgium, Secretary General.

INTERNATIONAL CONGRESS OF COMPARATIVE PATHOLOGY, Lausanne, Switzerland, May 26-31. Professor Hauduroy, 19 rue Cesar Roux, Lausanne, Switzerland, Secretary General.

INTERNATIONAL CONGRESS OF CRIMINOLOGY, London, England, Sept. 11-18. For information write: Dr. Carroll, 28 Weymouth St., London, W.1, England.

INTERNATIONAL CONGRESS OF EUROPEAN SOCIETY OF HAEMATOLOGY, Freiburg i,Br., Germany, Sept. 20-24. Prof. Dr. L. Heilmeyer, Hugstetter Strasse 55, Freiburg i,Br., Germany, Chairman.

INTERNATIONAL CONGRESS OF LIBRARIANSHIP AND DOCUMENTATION, Brussels, Belgium, Sept. 11-18. For information write: Dr. A. C. Breycha-Vauthier, Librarian, United Nations, Geneva, Switzerland.

INTERNATIONAL CONGRESS OF NEUROPATHOLOGY, London, England, Sept. 12-17. Dr. W. H. McMenemey, Maida Vale Hospital for Nervous Diseases, London, W.9, England, Secretary.

INTERNATIONAL CONGRESS OF PLASTIC SURGERY, Stockholm, Sweden, Aug. 1-4, and Uppsala, Sweden, Aug. 5. Dr. Tord Skoog, Uppsala, Sweden, General Secretary.

INTERNATIONAL CONGRESS ON URINARY LITHIASIS, Evian, France, Sept. 2-4. Mr. Rossollin-Grandville, Direction Cachet, Evian (Hte-Savoie), France, Secretary General.

INTERNATIONAL CONGRESS OF UROLOGY, Athens, Greece, April 10-18. Dr. Z. Kaires, 25, rue Voukourestion, Athens, Greece, Secretary General.

INTERNATIONAL HOSPITAL CONGRESS, Lucerne, Switzerland, May 29-June 3. Capt. J. E. Stone, International Hospital Federation, 10 Old Jewry, London, E.C.2, England, Hon. Secretary.

INTERNATIONAL MEDICAL CONGRESS, Verona, Italy, Sept. 1-4. For information write: c/o Offices of the International Verona Fair, Piazza Bra., Verona, Italy.

INTERNATIONAL SOCIETY FOR THE STUDY OF BIOLOGICAL RHYTHMS, Stockholm, Sweden, Sept. 15-17. For information write: Prof. Ture Petrén, Karolinska Institutet, Stockholm 60, Sweden.

INTERNATIONAL SURGICAL CONGRESS, Geneva, Switzerland, May 23-26. Dr. Max Thorek, 1516 Lake Shore Drive, Chicago, Illinois, U. S. A., Secretary General.

INTERNATIONAL SYNDICATE OF GYNECOLOGISTS AND OBSTETRICIANS, Meeting Hall of Medical Societies, Paris, France, June 27-28. Dr. Jacques Courtois, 1, rue Racine, Saint-Germain-en-Laye (S & O), France, Secretary General.

INTERNATIONAL UNION OF GYNECOLOGISTS AND OBSTETRICIANS, Paris, France, June 27-28. For information write: Dr. J. Courtois, 1, rue Racine, Saint-German-en-Laye, France.

IRISH OPHTHALMOLOGICAL SOCIETY, Dublin, Ireland, May 12-14. For information write: Dr. W. L. Benedict, 100 First Ave. Bldg., Rochester, Minnesota, U. S. A.

JAPAN MEDICAL CONGRESS, Kyoto University and Kyoto Prefectural Medical College, Kyoto, Japan, April 1-5. Dr. Mitsuharu Goto, University Hospital, Medical Faculty of Kyoto University, Kyoto, Japan, Secretary General.

MIDDLE EAST MEDICAL ASSEMBLY, Campus of American University of Beirut, Beirut, Lebanon, April 22-24. Dr. John L. Wilson, American University of Beirut, Beirut, Lebanon, Chairman.

NEURORADIOLOGIC SYMPOSIUM, London, England, Sept. 13-17. Dr. R. D. Hoare, National Hospital, Queen Square, London, W.C.1, England, Secretary.

PAN AMERICAN CONGRESS OF OPHTHALMOLOGY, Santiago, Chile, S. A., Jan. 9-14, 1956. Dr. Rene Contardo, Huerfanos 930, Of. 74, Santiago, Chile, Secretary General.

PAN AMERICAN CONGRESS ON RHEUMATIC DISEASES, Rio de Janeiro and Sao Paulo, Brazil, S. A., Aug. 14-20. For information write: Dr. Waldemar Bianchi, 126 Avenida Franklin D. Roosevelt, Rio de Janeiro, Brazil, S. A.

VENEZUELAN CONGRESS OF MEDICAL SCIENCES, Caracas, Venezuela, S. A., Nov. 18-26. Dr. A. L. Briceno Rossi, Apartado 4412, Ofic. del Este, Caracas, Venezuela, S. A., Secretary General.

WORLD CONGRESS OF ANESTHESIOLOGISTS, Scheveningen, Netherlands, Sept. 5-10. For information write: Mr. W. A. Fentener van Vlissingen, Noord-Houdringelaan, 24, Bilthoven, Netherlands.

WORLD FEDERATION FOR MENTAL HEALTH, Istanbul, Turkey, Aug. 21. For information write: Miss E. M. Thornton, 19 Manchester St., London, W.1, England.

WORLD MEDICAL ASSOCIATION, Vienna, Austria, Sept. 20-26. Dr. Louis H. Bauer, 345 East 46th St., New York 17, N. Y., U. S. A., Secretary General.

EXAMINATIONS AND LICENSURE

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: *Parts I and II in 1955.* April 19-20 (Part II only), June 21-22, Sept. 6-7 (Part I only). Candidates may file applications at any time, but the National Board must receive them at least six weeks before the date of the examination. New candidates should apply by formal registration; registered candidates should notify the board by letter and forward their fees. Exec. Sec., Dr. John B. Hubbard, 133 South 36th St., Philadelphia 4.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Written.* July 15. Final date for filing applications was Jan. 15. *Oral.* Colorado Springs, March 27-31. New York City, Oct. 23-27. Sec., Dr. Curtiss B. Hickcox, 80 Seymour St., Hartford 15.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written.* Various centers, June 30. *Oral.* Washington, D. C., Oct. 14-16. To be eligible, candidates must complete 36 months of training by October 1. Final date for filing application was March 15. Exec. Sec., Miss Janet Newkirk, 129 E. 52nd St., New York 22.

AMERICAN BOARD OF INTERNAL MEDICINE: *Oral.* Philadelphia, May 4-5; Washington, D. C., May 6-7; Portland, Ore., Sept. 14-16; Chicago, Nov. 30-Dec. 1. *Subspecialties. Gastroenterology.* Philadelphia, April 22-23. *Cardiovascular Disease.* Chicago, Nov. 30. The closing date for acceptance of applications for gastroenterology was Feb. 1, and for cardiovascular disease the closing date is June 1. Exec. Sec., Dr. William A. Werrell, 1 West Main St., Madison 3, Wis.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: *Oral.* St. Louis, April 28-30. New Haven, November. Oral examinations given in Spring and Fall. Final date for filing application for the Spring examination is October 1; for the Fall examination April 1. Sec., Dr. Leonard T. Furlow, Washington University School of Medicine, St. Louis 10.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Part II, Oral Examination.* Chicago, May 12-20. Case abstracts of candidates who participated in the Part I Examination must reach the office of the board not later than February 28. Sec., Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6.

AMERICAN BOARD OF OPHTHALMOLOGY: *Practical Examinations.* Philadelphia, May 27-30; Chicago, Oct. 9-14. Final date for filing application for 1955 practical examination was July 1, 1954. *Written.* January, 1956. Final date for filing application is July 1. Sec., Dr. Merrill J. King, 56 Ivie Road, Cape Cottage, Maine.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Part I.* Various locations, April. Final date for filing applications was Nov. 30, 1954. Sec., Dr. Harold A. Sofield, 122 South Michigan Ave., Chicago 3.

AMERICAN BOARD OF OTOLARYNGOLOGY: *Oral.* Chicago, Oct. 3-7. Final date for filing application is April. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City.

AMERICAN BOARD OF PATHOLOGY: *Written and Practical Examination for Pathologic Anatomy and Clinical Pathology.* Houston, April 4-6. Sec., Dr. William B. Wartman, 303 E. Chicago Ave., Chicago.

AMERICAN BOARD OF PEDIATRICS: *Oral.* Detroit, April 1-3; New York City, June 10-12; Chicago, Oct. 7-9; and Washington, D. C., Dec. 2-4. Admin. Sec., Mrs. John McK. Mitchell, 6 Cushman Road, Rosemont, Pa.

AMERICAN BOARD OF PHYSICAL MEDICINE AND REHABILITATION: Philadelphia, June 10-12. The final date for filing applications was March 1. Sec., Dr. Earl C. Elkins, 30 N. Michigan Ave., Chicago 2.

AMERICAN BOARD OF PLASTIC SURGERY: *Entire Examination.* Washington, D. C., April 30-May 2. Final date for filing case reports was Jan. 1. Corres. Sec., Miss Estelle E. Hillerich, 4647 Pershing Ave., St. Louis 8.

AMERICAN BOARD OF PREVENTIVE MEDICINE: *Certification in Public Health.* Berkeley, New York, Boston, Baltimore, Minneapolis, and New Orleans, April 14-15; Kansas City, Mo., Nov. 10-12. Sec.-Treas., Dr. Ernest L. Stebbins, 615 N. Wolfe St., Baltimore 5.

AMERICAN BOARD OF PROCTOLOGY: *Part I.* Philadelphia, May 7. It is possible that simultaneous examinations may be held in two other cities depending upon the geographic locations of candidates. *Part II.* Philadelphia, Sept. 17. Sec., Dr. Stuart T. Ross, 131 Fulton Ave., Hempstead, N. Y.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: San Francisco, mid-October; New York City, December. Sec., Dr. David A. Boyd, 102-110 Second Ave. S.W., Rochester, Minn.

AMERICAN BOARD OF RADIOLOGY: Chicago, week of May 22; week of Dec. 4. Final date for filing applications for the spring examination was Dec. 1, 1954. Candidates who will complete the required three years' training by June 30 will be eligible to appear for examination in May, and those candidates who will complete their training by Dec. 31 will be eligible to appear for examination in the fall. Sec., Dr. B. R. Kirklin, 429 First National Bank Bldg., Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Part I.* March 30. *Part II.* Cincinnati, March 14-15; San Francisco, April 18-19; Boston, May 16-17; Philadelphia, June 13-14. Sec., Dr. John B. Flick, 255 S. Fifteenth St., Philadelphia 2.

THE BOARD OF THORACIC SURGERY: *Written.* Feb. 25, 1956. Final date for filing applications was Jan. 1. Sec., Dr. Wm. M. Tuttle, 1151 Taylor Ave., Detroit 2.

MAGAZINE–TELEVISION REPORT

The following list of current medical articles in mass-circulation magazines and forthcoming network television programs on medical subjects is published each week only for the information of readers of THE JOURNAL. *Unless specifically stated, the American Medical Association neither approves nor disapproves of the articles and programs reported.*

TELEVISION

Monday, March 28, 1955

NBC-TV, 9 p. m. EST. "Medic." Rehabilitation of a child whose throat was burned with lye. Title: "All My Mothers, All My Fathers."

Tuesday, March 29

NBC-TV, 9:30 p. m. EST. "March of Medicine." An on-the-spot report of the effects of atomic radiation on the people of Hiroshima. Title: "Ten Years After Hiroshima."

MAGAZINES

Cosmopolitan, April, 1955

"My Patient Just Died," by Ambrose B. Karter, M.D., as told to Richard L. Frey

After a negligent patient's death, this doctor ponders the question of sending reminder notices and originating contact with patients who fail to seek needed medical care. This article is appended with the views on this approach by Drs. Dan Mellen, Homer Pearson, Walter B. Martin, I. S. Ravdin, Nathaniel Robin, and Thomas H. McGavack.

"What's New in Medicine," by Lawrence Galton

This compilation tells of the use of new drugs in treating patients with palsy, experimentation with solids in infant diets, stilbamidine for relieving tic douloureux, Clistin Maleate for alleviating allergies, trypsin in poliomyelitis, plastic cloth tubes for replacing diseased arteries, tests for determining the use of surgery, x-ray or radium in treating cervical cancer, and hydrocortisone for relieving the pain of injections in diabetics.

Pageant, April, 1955

"Lung Heart," by Leonard Engel

"A new heart disease is threatening city dwellers," and this writer tells of the causes of cor pulmonale, which killed 4,000 persons in London during the siege of contaminated fog in 1952.

"Salina Finds a Doctor," by Cal Bernstein

A photographic report of a young doctor's acceptance and success in medical practice in Salina, Utah. It tells how the small community sought a doctor, and how the doctor in turn found satisfaction and friendship in a rural area.

Coronet, April, 1955

"Muscles Are Marvelous," by John Pfeiffer

A description of the muscular make-up of the body and its coordination through the brain. The article also reports industry is studying the behavior of muscles for transferring chemical energy in machines directly into mechanical work.

Woman's Home Companion, April, 1955

"Report from the Polio Front," by Milton J. E. Senn, M.D.

A report of the 1955 plans of the National Foundation for Infantile Paralysis in testing the Salk vaccine. Following the injection of the vaccine last year in 500,000 children, "the signs have been so encouraging that the vaccine may now be regarded as having passed the experimental stage. As soon as the Federal Government licenses its use, it will be given with full confidence as a preventive for polio."

Sports Illustrated, March 14, 1955

"Tips on How to Stay in Good Shape—Keep in the Pink"

This occasional feature advises on problems that "seldom warrant a trip to the doctor, but they are undeniably irksome." The current subject is sore muscles, and the article outlines the chemical upset in such a condition, its cause and effect, and the remedy.

Reader's Digest, April, 1955

"The Facts About Your Weight," by Dr. Frederick J. Stare

This interview-type article discusses overweight and longevity, susceptibility to disease, appetite control, weight reduction, and diet.

"The Why of Aches and Pains," by Edward and Ruth Brecher

This article explains how nerves alert the brain to injuries sustained in various parts of the body and "is a sort of speedometer which measures the speed with which tissue damage is occurring." Researchers classify pain in three categories: pricking, burning, and aching. The article also discusses individual sensitivity and varying reactions of sufferers.

Redbook, April, 1955

"How to Keep Your Family Young," by Dr. Thomas K. Cureton Jr., with Bob Allison

Doctor Cureton, who is director of the Physical Fitness Research Center at the University of Illinois, outlines a series of exercises for both men and women as aids to keeping fit. He has also prepared a test for measuring one's balance, flexibility, agility, strength, power, and endurance.

"You and Your Health," by Alton L. Blakeslee

This column gives advice on vaccinations for babies and other baby care, allergies, tension, and false pregnancy.

McCall's, April, 1955

"News in Child Health," by Marguerite Clark

Brief information on aspirin in treating infants with rheumatic fever, treatment of birthmarks, causes of infant allergies, and motions of babies.

DEATHS

Avery, Oswald Theodore, Nashville, Tenn., emeritus member of the Rockefeller Institute for Medical Research in New York, died in the Vanderbilt University Hospital Feb. 20, aged 77, of carcinoma of the liver. Dr. Avery was born in Halifax, Nova Scotia, Oct. 21, 1877, and came to New York at the age of 10. He received an A.B. degree from Colgate University in 1900 and an M.D. degree from the Columbia University College of Physicians and Surgeons, New York, in 1904. After early work in bacteriology at the Hoagland Laboratory in Brooklyn, in 1913 he became associated with the Rockefeller Institute, where he was a member from 1923 until 1943 and continued his research for five years after retiring as an active member. He was past president of the American Association of Immunologists and the American Association of Pathologists and Bacteriologists and past president and vice-president of the Society of American Bacteriologists, of which he was an honorary member. The many societies of which he was a member included the Association of American Physicians, American Society for Clinical Investigation, New York Academy of Medicine, Harvey Society, the American Public Health Association, and the National Academy of Sciences. He was an honorary member of the Pathological Society of Great Britain and Ireland, the Society of General Microbiology (England), and the New York Academy of Sciences, and foreign member of the Royal Society of London, Société Philomathique de Paris, Academie Royale de Médicine de Belgique, Norwegian Academy of Sciences, and the Royal Danish Academy of Sciences and Letters. Among his many awards were the Joseph Mather Smith prize of Columbia University, John Phillips Memorial medal of the American College of Physicians, Pasteur gold medal of the Swedish Medical Society in Stockholm, Paul Ehrlich gold medal, the gold medal of the New York Academy of Medicine, Copley medal of the Royal Society of London, Lasker award of the American Public Health Association, Kober medal of the Association of American Physicians, and the Passano Foundation award. In World War I he was a captain in the medical corps of the U. S. Army. During World War II, Dr. Avery was a member of the subcommittee on infectious diseases of the National Research Council, consultant to the Secretary of War, and member of the Board for Study and Control of Epidemic Diseases, U. S. Army. Also in 1948 he was a consultant and member of the streptococcic diseases commission, Epidemiological Board of the Armed Forces. His research work brought him honorary degrees from Colgate University, McGill University in Montreal, New York University, University of Chicago, and Rutgers University in New Brunswick, N. J. Dr. Avery was an outstanding medical bacteriologist. His work with the pneumococcus not only was of great practical importance but had broad implications in other fields, including that of genetics. His early work on the classification of pneumococci into many distinct types led to studies on the chemical basis for the differences between the several types. He thus became one of the founders of the science of immunochemistry. These investigations demonstrated that the specific substance of the pneumococcus is a complex carbohydrate or polysaccharide and established for the first time that carbohydrates are of importance in immunity. His broad insight is illustrated by his investigations of a phenomenon known as the transformation of pneumococcic types, a phenomenon of general interest because it was perhaps the only example in which an inherited change in a living organism could be predictably produced at will in the laboratory. His work in this field culminated in the discovery that the substance responsible for the transformation is a desoxyribonucleic acid. The implications of this finding are now widely recognized, and it provides substantial evidence for the current concept that genes are made up of desoxyribonucleic acid.

Bigger, Isaac Alexander ⊕ Richmond, Va.; born in Clover, S. C., June 25, 1893; University of Virginia Department of Medicine, Charlottesville, 1919; professor of surgery at the Medical College of Virginia; at one time assistant professor of surgery at his alma mater, and associate professor of surgery at Vanderbilt University School of Medicine in Nashville, Tenn.; member of the founders group of the American Board of Surgery; member of the American Surgical Association, and the International Society of Surgery; past president of the Southern Surgical Association, American Association for Thoracic Surgery, Eastern Surgical Society, Southern Society of Clinical Surgeons, Richmond Academy of Medicine, and the Virginia Division of the American Cancer Society; in 1935-1936 chairman of the surgical section of the Southern Medical Association and in 1933-1934 chairman of the medical section of the Virginia Academy of Science; fellow of the American College of Surgeons; surgeon in chief, Medical College of Virginia Hospitals; surgeon, Crippled Children's Hospital; co-author with Dr. J. Shelton Horsley of "Operative Surgery"; died Jan. 27, aged 61, of bronchial asthma, pulmonary emphysema, and mucopurulent bronchitis.

Felsen, Joseph ⊕ New York City; born in New York City Sept. 4, 1892; Columbia University College of Physicians and Surgeons, New York, 1915; specialist certified by the American Board of Pathology; member of the American Gastro-Enterological Association, College of American Pathologists and the American Society of Clinical Pathologists; fellow of the American Public Health Association and the New York Academy of Medicine; honorary life member of the Association of Military Surgeons of the United States; past president of the Bronx Pathological Society; in World War I served as a captain in the medical corps, American Expeditionary Forces, and was director of laboratories in Base Hospital No. 47 in France; director of the Pan American and International Dysentery Registry; author of "Bacillary Dysentery, Colitis and Enteritis," and co-author with Dr. J. M. Lynch of "Tumors of the Colon and Rectum"; received honors from Mexico and Argentina for research, which helped curb intestinal ailments in those countries; pathologist, director of laboratories and research, and past president of the medical board of the Bronx Hospital, where he died Jan. 27, aged 62, of coronary thrombosis.

Yost, Orin Ross ⊕ Ormond Beach, Fla.; born in Kimball, W. Va., Feb. 1, 1906; Medical College of Virginia, Richmond, 1930; interned at St. Elizabeth Hospital in Washington, D. C.; member of the Southern Psychiatric Association; fellow of the American Psychiatric Association; past president of the Southeastern Society of Neurology and Psychiatry; served during World War II; at one time associated with the Pilgrim State Hospital in Brentwood, N. Y., Veterans Administration hospitals in Chillicothe, Ohio, in Roanoke, Va., in Augusta, Ga., and in Perry Point, Md., and the Neuropsychiatric Institute of the Hartford (Conn.) Retreat; formerly superintendent of the Weston (W. Va.) State Hospital and later psychiatrist in chief of the Edgewood Sanitarium Foundation in Orangeburg, S. C.; while active in South Carolina was voted an honorary life member of the state junior chamber of commerce; received a plaque in recognition of his distinguished service; consultant in psychiatry at Halifax District Hospital in Daytona Beach; author of several books on psychiatry and related subjects; served on the board of editors of the *Tri-State Medical Journal;* died Jan. 23, aged 48, of coronary thrombosis.

Carson, Virgil Hope ⊕ Captain, U. S. Navy, retired, Oakland, Calif.; born in Richmond, Va., Jan. 5, 1893; Medical College of Virginia, Richmond, 1914; appointed assistant surgeon in the medical corps of the Naval Reserve on Aug. 25, 1915; later transferred to the regular Navy and attained the rank of captain, in August, 1939; retired for physical disability on July 1, 1943; during more than 27 years of service in the medical corps of the Navy, served with the U. S. Marines in Santo Domingo and in Shanghai, in the U. S. S. Castine, Nahma, Panther, Patricia, New Orleans, Medua, Texas, Barker, and Scorpion, at the Recruiting Stations, Brooklyn, N. Y., and Richmond, Va., and in the Naval hospitals, Norfolk, Va., New York, Phifadelphia, San

⊕ Indicates Member of the American Medical Association.

Diego, and Mare Island, Calif.; fellow of the American College of Surgeons; associated with the Peralta Hospital, where he died Feb. 9, aged 62, of myocardial infarction and arteriosclerosis.

Anderson, Samuel Newton, South Pittsburg, Tenn.; Vanderbilt University School of Medicine, Nashville, 1915; served during World War I; county physician; died Dec. 31, 1954, aged 66, of cerebral thrombosis.

Armstrong, John Hinton ⊕ Kirkwood, Mo.; Beaumont Hospital Medical College, St. Louis, 1900; past president of St. Louis County Medical Society; served on the staffs of St. Luke's and Jewish hospitals in St. Louis; died in the Evangelical Deaconess Hospital, St. Louis, Jan. 22, aged 78.

Babcock, Myron Lawrence, Denver; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1901; died in the Mercy Hospital Dec. 21, 1954, aged 82.

Barnett, William R. ⊕ Calhoun, Ga.; Chattanooga (Tenn.) Medical College, 1902; died in Brawner's Sanitarium in Smyrna, Jan. 15, aged 79, of arteriosclerosis.

Barr, Warden Taylor, Fresno, Calif.; Cooper Medical College, San Francisco, 1896; associated with the Community Hospital; died Jan. 25, aged 83, of cancer.

Beard, John Jacob, Cobleskill, N. Y.; Albany (N. Y.) Medical College, 1897; past president of the Schoharie County Medical Society; served during World War I; died in Veterans Administration Hospital in Albany Jan. 31, aged 79, of diabetes mellitus.

Beck, William Francis ⊕ Lake Grove, Ore.; University of Oregon Medical School, Portland, 1930; served during World Wars I and II; died in the Portland Sanitarium and Hospital Jan. 31, aged 55, of carcinoma of the soft palate and glands of the neck.

Bentz, Felix John, Danvers, Mass.; St. Louis College of Physicians and Surgeons, 1926; on the staff of the Danvers State Hospital, where he died Jan. 6, aged 60, of coronary thrombosis.

Bloomenthal, H. Myer ⊕ Boston; Middlesex University School of Medicine, Waltham, Mass., 1937; on the staff of the Massachusetts Memorial Hospitals; served during World War II; died in the Nathan Littauer Hospital, Gloversville, Jan. 25, aged 45, of cerebral vascular accident.

Bogardus, Clifton ⊕ Brooklyn, N. Y.; Albany (N. Y.) Medical College, 1912; attending physician at Victory Memorial Hospital; treasurer, trustee, and administrator of the Samaritan Hospital, where he died Jan. 15, aged 70, of complications following rheumatoid arthritis.

Bonnell, William Le Roy ⊕ Chickasha, Okla.; Cleveland Homeopathic Medical College, 1907; for many years member of the school board; died Jan. 22, aged 71, of cerebral hemorrhage.

Brace, Donald Edward ⊕ New York City; New York Homeopathic Medical College and Flower Hospital, New York City, 1914; professor of anesthesiology at the New York Medical College, Flower and Fifth Avenue Hospitals; specialist certified by the American Board of Anesthesiology; member of the American Society of Anesthesiologists; on the staff of the Metropolitan Hospital and chief anesthetician at Flower and Fifth Avenue Hospitals; died Jan. 24, aged 61, of acute myocarditis, arteriosclerosis, and diabetes mellitus.

Brewer, Malcolm Irvin ⊕ Aberdeen, Miss.; Tulane University of Louisiana School of Medicine, New Orleans, 1916; served during World War I; killed Jan. 25, aged 61, when a gun he was cleaning accidentally discharged.

Brown, Francis Wiley ⊕ Salt Lake City; Chicago College of Medicine and Surgery, 1916; died in Lynwood, Calif., Jan. 19, aged 70, of arteriosclerotic heart disease and diabetes mellitus.

Brown, Ralph Neally, Lynnfield Center, Mass.; Tufts College Medical School, Boston, 1912; member of the Massachusetts Medical Society; past president of the Malden Medical Society; served during World War I; died in Melrose (Mass.) Hospital Jan. 25, aged 68, of coronary thrombosis.

Burbank, Caryl ⊕ Washington, D. C.; born in 1880; Georgetown University School of Medicine, Washington, 1903; for many years associate professor of principles and practice of medicine at Howard University College of Medicine; during World War I medical examiner for draft inductions and was chief medical examiner for the American Red Cross; during World War II a member of the Medical Advisory Board C, Selective Service System; died in Rockville, Md., Jan. 10, aged 75, of coronary occlusion.

Burke, Thomas Joseph, Chicago; Loyola University School of Medicine, Chicago, 1926; on the staff of the Mercy Hospital; died Feb. 10, aged 59, of myocardial infarction.

Burnett, Hayes Joseph, Buffalo; Howard University College of Medicine, Washington, D. C., 1933; member of the Medical Society of the State of New York; served during World War II; on the staff of Our Lady of Victory Hospital, Lackawanna, and Columbus Hospital; died in Millard Fillmore Hospital Jan. 8, aged 49, of carcinoma of the pancreas.

Burnett, John Daniel ⊕ Toledo, Ohio; St. Louis University School of Medicine, 1945; specialist certified by the American Board of Pediatrics; on the staffs of the Maumee Valley and St. Vincent's hospitals; died Dec. 4, 1954, aged 34.

Burton, Charles Hammon ⊕ Baltimore; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1916; served in France during World War I; died Jan. 24, aged 61, of coronary occlusion.

Calhoun, N. Curtis, Ashton, Ill.; St. Louis College of Physicians and Surgeons, 1909; died in Amboy (Ill.) Public Hospital Jan. 29, aged 74, of pneumonia as the result of injuries received in an automobile accident.

Callfas, William Frederick ⊕ Pasadena, Calif.; Queen's University Faculty of Medicine, Kingston, Ontario, Canada, 1898; member of the Nebraska State Medical Association; professor emeritus of otorhinolaryngology at the University of Nebraska College of Medicine in Omaha, where for many years he practiced, and where he was on the staff of the Nebraska Methodist Hospital; at one time on the faculty of Barnes Medical College in St. Louis; fellow of the American College of Surgeons; died Jan. 24, aged 86, of congestive heart failure.

Campbell, Robert A., Minneapolis; University of Minnesota College of Medicine and Surgery, Minneapolis, 1896; fellow of the American College of Surgeons; consultant at the Abbott Hospital; died Jan. 7, aged 86, of arteriosclerosis.

Campbell, William H., Chickasha, Okla. (licensed in Oklahoma under the Act of 1908); died Jan. 18, aged 83, of carcinoma.

Carrow, Joseph Franklin, Marion, Mich.; Michigan College of Medicine and Surgery, Detroit, 1898; for five years village president; formerly practiced in Cadillac, where he was secretary of the Wexford County Medical Society, and on the staff of the Mercy Hospital; served as county coroner and as president of the chamber of commerce; died Feb. 2, aged 80, of diabetes mellitus.

Carter, Elmer Woodhall, Haverhill, Mass.; Middlesex College of Medicine and Surgery, Cambridge, 1915; for many years on the staff of the Benson Hospital; died in Boston Jan. 28, aged 70, of arteriosclerotic heart disease.

Cary, William Sheldon ⊕ Reydon, Okla.; Milwaukee Medical College, 1911; died Jan. 20, aged 73, of arteriosclerosis.

Cheeseman, William Burton ⊕ Kansas City, Mo.; University of Wisconsin Medical School, Madison, 1941; specialist certified by the American Board of Surgery; served during World War II; associated with the Kansas City General Hospital; died Jan. 11, aged 37, of injuries received when struck by an automobile.

Clark, Raymond ⊕ Brooklyn; Columbia University College of Physicians and Surgeons, New York, 1895; an associate member of the American Medical Association; for many years clinical professor of medicine at the Long Island College Hospital; past president of the Brooklyn Pathological Society; fellow of the American College of Physicians; served during World War I; on the staffs of the Brooklyn and Methodist hospitals; died in the Johns Hopkins Hospital, Baltimore, Jan. 23, aged 83, of carcinoma of the pancreas.

Claytor, Hubert ⊕ Hopkins, S. C.; University of Maryland School of Medicine, Baltimore, 1886; died Nov. 7, 1954, aged 91, of heart failure.

Cody, Edmond Francis ⊕ North Attleboro, Mass.; born in 1870; Harvard Medical School, Boston, 1893; member of the House of Delegates of the American Medical Association in 1917, from 1920 to 1924, in 1926, from 1928 through 1937, and in 1940; for many years acting assistant surgeon and medical officer in charge of the U. S. Quarantine Station in New Bedford for the U. S. Public Health Service; died in the Sturdy Memorial Hospital, Attleboro, Feb. 4, aged 84, of cardiac hypertrophy and bronchopneumonia.

Cohen, Samuel James ⊕ Brooklyn, N. Y.; Long Island College Hospital, Brooklyn, 1917; also a graduate in pharmacy; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; associated with the Jewish Sanitarium and Hospital for Chronic Diseases, where he was president of the medical board, and the Jewish Hospital; died Jan. 30, aged 66, of arteriosclerotic heart disease.

Cole, Alvin Vernon ⊕ Chicago; Northwestern University Medical School, Chicago, 1893; member of the honorary staff of Mercy Hospital; died in Virginia Beach, Va., Feb. 18, aged 86.

Coles, James Garfield, Schwenkville, Pa.; Jefferson Medical College of Philadelphia, 1913; died Jan. 10, aged 74.

Corey, Paris Vance, Fort Lauderdale, Fla.; the Hahnemann Medical College and Hospital, Chicago, 1904; served during World War I; chief surgeon on the S. S. Leviathan; died Dec. 5, 1954, aged 69, of arteriosclerotic heart disease.

Creasy, Raymond Claude ⊕ New York City; Medico-Chirurgical College of Philadelphia, 1910; at one time assistant professor of clinical otolaryngology at the New York Post-Graduate Medical School and Hospital, Columbia University; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; on the staffs of the University, Midtown, Wickersham, Manhattan General, and Reconstruction hospitals; died Jan. 23, aged 69, of a heart attack.

De Motte, Russell Algier ⊕ Bloomington, Ind.; Indiana University School of Medicine, Indianapolis, 1927; served during World War II; formerly health officer; died Jan. 14, aged 54, of coronary occlusion.

Dengler, Henry Paul ⊕ Springfield, N. J.; Jefferson Medical College of Philadelphia, 1908; served during World War I; for many years president of the Union County Mosquito Commission; health officer and school physician of Summit and Springfield; on the staff of the Overlook Hospital in Summit; died Feb. 11, aged 69, of adenocarcinoma of the sigmoid.

De Nike, Andrew James ⊕ Detroit; Grand Rapids (Mich.) Medical College, 1903; died Feb. 16, aged 79, of acute appendicitis and pneumonia.

Denton, John Fletcher ⊕ Atlanta, Ga.; University and Bellevue Hospital Medical College, New York, 1903; member of the South Atlantic Association of Obstetrics and Gynecology; fellow of the American College of Surgeons; professor emeritus of clinical gynecology at Emory University School of Medicine; served during World War I; on the staff of the Grady Hospital, Steiner Clinic, and Emory University Hospital; died Jan. 30, aged 77.

Denton, Nathan Carter ⊕ Oneonta, Ala.; University of Nashville (Tenn.) Medical Department, 1905; formerly mayor of Oneonta; member of the state legislature; died Jan. 16, aged 72, of coronary thrombosis.

Diddle, John Franklin, Oakland, Calif.; College of Physicians and Surgeons of San Francisco, 1902 and 1905; died in the Kaiser Foundation Hospital Jan. 21, aged 84, of acute myocardial infarction.

DiStefano, Carmelo ⊕ Omaha; University of Nebraska College of Medicine, Omaha, 1925; on the staff of the Creighton Memorial St. Joseph's Hospital, Doctors Hospital, Lutheran Hospital, and St. Catherine's Hospital; died Feb. 1, aged 59, of coronary thrombosis.

Droz, Adolphus Keith ⊕ Van Nuys, Calif.; State University of Iowa College of Medicine, Iowa City, 1928; fellow of the American College of Surgeons; served during World War II; died in Long Beach Jan. 23, aged 52.

Duff, Roden Robinson Sr. ⊕ Chicago; Dearborn Medical College, Chicago, 1907; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1908; fellow of the American College of Surgeons; served during World War I; formerly on the faculty of the University of Illinois College of Medicine; associated with St. Luke's Hospital; died Feb. 12, aged 77, of bronchogenic carcinoma of the lung.

Dunn, William Harold ⊕ New York City; Harvard Medical School, Boston, 1927; associate professor of clinical psychiatry at Cornell University Medical College; certified by the National Board of Medical Examiners; member of the American Psychoanalytic Association and the American Psychiatric Association; served during World War II; on the staff of the New York Hospital; died Feb. 11, aged 56.

Duryea, Arthur Warren ⊕ Palm Springs, Calif.; Columbia University College of Physicians and Surgeons, New York, 1923; specialist certified by the American Board of Internal Medicine; member of the American College of Chest Physicians; fellow of the American College of Physicians; served during World War I; formerly area section chief, medicine, St. Louis Medical Area, Veterans Administration; died Jan. 14, aged 58, of cardiovascular accident.

Eberhard, Le Roy Crockett ⊕ Akron, Ohio; Western Reserve University Medical Department, Cleveland, 1900; past president of the Summit County Medical Society; for many years associated with the City Hospital; died Jan. 30, aged 84.

Eddy, Alfred Herman, Aurelia, Iowa; Rush Medical College, Chicago, 1896; on the staff of the Sioux Valley Hospital in Cherokee, where he died Jan. 15, aged 85, of carcinoma.

Edmondson, Henry Howard ⊕ Clarksville, Tenn.; Vanderbilt University School of Medicine, Nashville, 1907; on the staff of the Clarksville Memorial Hospital, where he died Jan. 10, aged 70, of carcinoma of the larynx.

Ellis, Arthur Jeffries ⊕ Glen Ridge, N. J.; University of Vermont College of Medicine, Burlington, 1914; served during World War I; formerly practiced in Newark, where he was on the staffs of the Beth Israel Hospital and the Presbyterian Hospital, where he died Jan. 26, aged 65, of uremia and hypertensive arteriosclerotic heart disease.

Evans, Robert Bernard, Avalon, Calif.; Creighton University School of Medicine, Omaha, 1934; died Jan. 16, aged 44.

Eyman, Elmer Vail ⊕ Philadelphia; Rush Medical College, Chicago, 1911; specialist certified by the American Board of Psychiatry and Neurology; an associate member of the American Medical Association; member of the American Psychiatric Association; served during World War I; formerly on the faculty of Medico-Chirurgical College, Graduate School of Medicine, University of Pennsylvania; died Feb. 13, aged 70.

Field, William Hill, Evansville, Ind.; University of Pennsylvania Department of Medicine, Philadelphia, 1898; fellow of the American College of Surgeons; on the staffs of the Protestant Deaconess and Welborn-Memorial Baptist hospitals; drowned Feb. 4, aged 78.

Fisher, Mulford Keene ⊕ Philadelphia; Jefferson Medical College of Philadelphia, 1906; an associate member of the American Medical Association; member of the American Roentgen Ray Society; formerly associated with Mount Sinai, Stetson, Northwestern, and Skin and Cancer hospitals; died Feb. 6, aged 71, of coronary thrombosis.

Goddard, Roy Keene ⊕ Skiatook, Okla.; University of Oklahoma School of Medicine, Oklahoma City, 1912; served during World War I; died in St. John's Hospital in Tulsa, Jan. 24, aged 70, of arteriosclerotic heart disease and cerebral embolism.

Griffiths, Evan Henry Montgomery ⊕ Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1909; fellow of the American College of Surgeons; one of the founders of the West Suburban Hospital in Oak Park, where he was on the executive staff; died Jan. 27, aged 68, of cerebral hemorrhage.

Harf, Alfred, Kew Gardens, N. Y.; Ludwig-Maximilians-Universität Medizinische Fakultät, München, Bavaria, Germany, 1910; member of the Medical Society of the State of New York; on the staff of the Kew Gardens General Hospital; died Nov. 6, 1954, aged 69, of heart disease.

Hayes, Justin Edward ⊕ Northampton, Mass.; College of Physicians and Surgeons, Baltimore, 1904; on the staff of the Cooley Dickinson Hospital; a trustee of the Northampton State Hospital; died Feb. 2, aged 73, of coronary thrombosis and hypertensive heart disease.

Hayes, Oscar, Eureka, Fla.; Medical Department of Tulane University of Louisiana, New Orleans, 1903; veteran of the Spanish-American and World Wars; at one time city health commissioner of Denver; formerly practiced in Akron, Ohio, where he was police surgeon and county coroner, and on the staffs of the City and Peoples hospitals; died Jan. 18, aged 75, of a heart attack.

Heilpern, Leopold M. ⊕ New York City; Medizinische Fakultät der Universität, Vienna, Austria, 1925; anesthetist at Greenpoint Hospital in Brooklyn; died Nov. 24, 1954, aged 58.

Hellman, Alfred Myer ⊕ New York City; Columbia University College of Physicians and Surgeons, New York, 1905; specialist certified by the American Board of Obstetrics and Gynecology; fellow of the American College of Surgeons; past president of the Medical Society of the County of New York; served during World War I; consultant at the Lenox Hill and Misericordia hospitals; died Jan. 12, aged 74, of cerebral thrombosis.

Highfill, Elisha Jay ⊕ Cave Springs, Ark.; Barnes Medical College, St. Louis, 1899; died Jan. 21, aged 81, of arteriosclerosis and cerebral hemorrhage.

Irwin, James Robert ⊕ Springfield, Ill.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1906; also a graduate in pharmacy; on the staff of St. John's Hospital and the Memorial Hospital, where he died Jan. 21, aged 77.

Kane, William W. ⊕ Pinckneyville, Ill.; College of Physicians and Surgeons, Chicago, 1886; died Jan. 14, aged 90, of cerebral hemorrhage.

Kattenhorn, Frederick, Newport, Ky.; Hygeia Medical College, Cincinnati, 1898; Eclectic Medical Institute, Cincinnati, 1902; formerly practiced in Cincinnati, where he was on the staff of the Bethesda Hospital; died Jan. 24, aged 87, of cerebral hemorrhage and arteriosclerosis.

Kincaid, John Henry, Brownsville, Tenn.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1897; died Jan. 21, aged 84.

Kittrell, William Hunter ⊕ Mount Pleasant, Tenn.; University of Nashville Medical Department, 1892; Vanderbilt University School of Medicine, Nashville, 1892; one of the organizers of the Farmers and Merchants Bank and served as vice-president and director for many years; died Jan. 6, aged 88.

Lambdin, Hiram Stanfill, Caney, Kan.; Kansas City (Mo.) Medical College, 1904; died in the Coffeyville (Kan.) Memorial Hospital Jan. 16, aged 74, of cirrhosis of the liver.

Levinson, Leon ⊕ Boston; Tufts College Medical School, Boston, 1943; assistant clinical professor of medicine at his alma mater; served during World War II; associated with the Boston City, Beth Israel, Faulkner, and Massachusetts Women's hospitals; died Jan. 9, aged 35, of a heart attack.

Lyle, Walter Gillespie ⊕ Minerva, Ohio; Starling-Ohio Medical College, Columbus, 1912; past president and vice-president of the Carroll County Medical Society; on the staff of Alliance City (Ohio) Hospital; died Dec. 11, 1954, aged 74, of coronary occlusion.

McCambridge, Leonard Augustine, Kingston, N. Y.; Queen's University Faculty of Medicine, Kingston, Ontario, Canada, 1907; died Nov. 18, 1954, aged 66.

McKinney, Clarence David, Avon Park, Fla.; Chicago College of Medicine and Surgery, 1914; served during World War I; died Jan. 26, aged 66, of coronary thrombosis.

McMillan, Charles B. ⊕ Gracemont, Okla.; University of Oklahoma School of Medicine, Oklahoma City, 1917; died in the Anadarko (Okla.) Hospital Nov. 20, 1954, aged 64, of heart disease.

Mercer, Warren Charles, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1899; professor emeritus of obstetrics at his alma mater; fellow of the International College of Surgeons and the American College of Surgeons; served during World War I; associated with St. Luke's and Children's Medical Center; consultant at the Memorial Hospital of Chester County, West Chester, and the J. Lewis Crozer Homeopathic Hospital in Chester; died Dec. 17, 1954, aged 83, of cardiac failure.

Morgan, Norman Daniel ⊕ San Francisco; Cooper Medical College, San Francisco, 1910; fellow of the American College of Surgeons; served during World War I; died Jan. 15, aged 69, of pneumonia with metastatic carcinoma.

Northrop, Edward Raymond, Spokane, Wash.; Hahnemann Medical College and Hospital of Philadelphia, 1898; Medico-Chirurgical College of Philadelphia, 1899; on the staffs of the St. Luke's Hospital, Deaconess Hospital, and the Sacred Heart Hospital, where he died Jan. 16, aged 84, of hypertensive cardiovascular disease.

Oliver, Richard Loomis, Smithfield, N. C.; Jefferson Medical College of Philadelphia, 1942; interned at the Bryn Mawr (Pa.) Hospital; served a residency at the Kensington Hospital for Women in Philadelphia; formerly on the staff of the Veterans Administration Hospital in Fort Howard, Md.; died in the Blackwelder Hospital in Lenoir Dec. 3, 1954, aged 36.

Robb, Robert Worth ⊕ Frederick, Md.; State University of Iowa College of Medicine, Iowa City, 1904; member of the Iowa State Medical Society and the American Psychiatric Association; at one time on the staff of the State Hospital in Osawatomie, Kan.; for many years superintendent of the State Hospital in Independence, Iowa; died Jan. 29, aged 79, of arteriosclerotic heart disease.

Schoubye, O. Robert, Brooklyn, N. Y.; Indiana University School of Medicine, Indianapolis, 1925; on the staffs of Methodist and Carson C. Peck Memorial hospitals; trustee of Bay Ridge Savings Bank; died Feb. 2, aged 58, of cirrhosis of the liver, toxic hepatitis, and melanoma of the left eye with metastasis to the brain.

Schwer, John Louis ⊕ Pueblo, Colo.; University of Colorado School of Medicine, Denver, 1909; an associate member of the American Medical Association; past president of the Pueblo County Medical Society; on the staffs of the Corwin, St. Mary, and Parkview Episcopal hospitals; died Jan. 17, aged 69, of gastrointestinal hemorrhage, pulmonary emphysema, and hypertension.

Stewart, Robert Bigger ⊕ Los Angeles; Kansas Medical College, Medical Department of Washburn College, Topeka, 1905; member of the founders group of the American Board of Surgery; fellow of the American College of Surgeons; on the staff of Queen of Angels Hospital; at one time practiced in Topeka, Kan.; formerly member of the editorial board of the *Journal of the Kansas Medical Society;* died Jan. 19, aged 75, of reticulum cell sarcoma.

Tabb, Harry Adams ⊕ Gloucester, Va.; Medical College of Virginia, Richmond, 1913; one of the founders and past president of the Gloucester Medical Society and the Mid-Tidewater Medical Society; county health officer and county medical examiner; died Jan. 8, aged 67, of coronary thrombosis.

Wachsman, Jacob, Brooklyn, N. Y.; Albany (N. Y.) Medical College, 1901; member of the Medical Society of the State of New York; died in the Adelphi Hospital Feb. 9, aged 77, of coronary disease.

Wagener, Henry Louis ⊕ Brooklyn, N. Y.; University and Bellevue Hospital Medical College, New York, 1911; fellow of the American College of Surgeons; on the courtesy staffs of the Prospect Heights Hospital and the Methodist Hospital, where he died Jan. 22, aged 71, of heart disease.

FOREIGN LETTERS

ARGENTINA

New Method of Selecting the Teaching Staff.—The academic year in the Argentine universities ended Oct. 31, 1954. By a decree of the rector of the University of Buenos Aires all the members of the teaching staff, except the professors and assistant professors in each department, resigned. New appointees were not selected by the professors, as in the past, but by the student societies authorized by the government and the university. In many cases the candidates recommended by the professors were not selected, in spite of unquestioned qualifications, because they were not members of the official party or not approved by the student official delegate.

Death of Professor Agote.—Prof. Luis Agote, who was retired many years ago, died on Nov. 13, 1954, at the age of 82. He was the first to introduce sodium citrate to prevent clotting during blood transfusion. The first patient was given such a transfusion on Nov. 9, 1914. After many successful transfusions, Dr. Agote sent information through diplomatic channels to the medical services of the armies engaged in World War I, and his methods were promptly applied to battle casualties.

ENGLAND

Comparison of Vaccination with Vole Bacillus and BCG.—A murine form of acid-fast bacillus found in voles was described in 1937 by Wells, and from this organism he prepared a vaccine that produced conversions in tuberculin reactions and acted in a manner similar to BCG vaccine. Frew, Davidson, and Reid have compared the results of vaccination with BCG and vole bacillus vaccines (*Brit. M. J.* **1**:133, 1955). The investigation began in the autumn of 1951. Of the 783 children between 1 and 15-year-old residents in the homes, 705 were negative reactors to 100 I. T. U. of old tuberculin. Radiological examination failed to show any chest lesions in the negative reactors. One group of 288 children was vaccinated with BCG and another group of 280 was given the vole vaccine. This was administered in two forms, a dry, reconstituted vaccine, and a liquid vaccine. The BCG vaccine was given in the routine intradermal manner, and the vole bacillus vaccine by the multiple puncture method to those aged 5 years and over and intradermally to those under 5 years of age. After three years' observations it was found that conversion of the tuberculin reaction took place more rapidly with BCG vaccine, but at six to eight weeks after vaccination the rates in both groups were equal. Conversions ultimately took place in all of the subjects, indicating that the final allergic response is equally satisfactory with both vaccines. The reversion rates in both series showed little difference at six months and a year, but by the end of the second year the reversion rate was higher in the BCG vaccinated group, suggesting that the allergy produced by the vole vaccine is more permanent or at least stronger than that resulting from vaccination with BCG. The clinical course after vole bacillus vaccination was milder than with BCG. The cosmetic results with the vole bacillus vaccine were, however, not as good as with BCG, which left no objectionable scars. After multiple puncture with vole bacillus vaccine the puncture marks often became indurated, and later lupoid in 5% to 15% of the subjects. The incidence of these reactions was rather high, and for this reason the vole vaccine could not be used on more than an experimental basis until this objection had been overcome. No case of tuberculous infection was reported during the two year period of study.

Fertility in Britain.—Much detailed information about the trend and pattern of fertility in Great Britain has been published by Glass and Grebenik, who, with their collaborators, undertook a family census covering more than a million women in Great Britain (Trend and Pattern of Fertility in Great Britain, London, Her Majesty's Stationery Office, 1954). During the last century mortality and other statistics were compiled, but fertility statistics were neglected until 1911, when a fertility census was undertaken as part of the general census. The family census organized by Glass and Grebenik was not authorized by law but relied entirely on the cooperation of the women who were approached. Much press and radio publicity preceded it, and, although some sections of the press objected to "snooping," the response was good. Replies were obtained from 87.5% of the million or more women approached for information, and a random 10% sample was selected. Cross checks with national vital statistics revealed no serious bias as a result of the sampling or the failure of 12.5% of the women to cooperate.

The outstanding and not unexpected picture emerging from the survey was one of a dwindling family. The average family of a woman married in the period 1870 to 1879 was 5.8 children; for one married in 1925 it was 2.2. In the period 1870 to 1879 8% of marriages were childless; in 1925 the figure was 16%. In the years 1870 to 1879 60% of all families consisted of five or more children; but in 1925 most families consisted of only one or two children, and in only 11% were there five or more children. Fertility also depends on age at the time of marriage, occupation, and social class. The professional classes marry late and have small families, but late marriage does not explain the rise in the size of the family from 1.6 among professional classes, to nearly 2 among nonmanual wage-earners, and 3.35 among industrial laborers. As would be expected the younger the age at the time of marriage the larger the number of children in the family. Fertility is highest among laborers, agricultural workers, and manual wage-earners; intermediate for farmers, who must have children to help them; and low for professional and salaried workers. Farmers' wives marry at a later age than the wives of nonmanual workers, yet they have larger families. Age at the time of marriage and family size are related only in so far as they are both expressions of the complex of social attitudes that distinguish one class from another. These social attitudes are not immutable; even in the same social group fertility has changed in 50 years. Thus the wives of men of the managerial class married in the 1890's had families just as large as those of the wives of unskilled workers married in the period 1920 to 1924.

Another fact emerging from the survey is that women now complete their families earlier in their marriage than they did formerly. For marriages between 1920 and 1924 the interval between marriage and the arrival of the first child was 27 months for families of one child, and 13 months for families ultimately totaling four children. The decline in childbearing is greatest in the later stages of married life, and the decline in fertility in this period is especially marked in wives of the nonmanual occupational groups.

Causes of Crying.—In a lecture to the Harrogate Medical Society, Professor Illingworth, of the University of Sheffield, analyzed the causes of crying in infants and children. He said that in the first three months of life the commonest cause of crying is discomfort, of which hunger is the most likely source. Excessive or prolonged crying is usually the result of keeping the baby waiting a long time for food when he is ready for it through adherence to a rigid feeding schedule in the mistaken idea that a baby will learn bad habits if he is fed when he wants his food. Babies often cry from hunger because they are taken away from the breast before they have finished. It is wrong, he says, to let babies feed for a fixed period, say 10 minutes, because all breasts and nipples are not alike in the ease with which milk can be obtained from them. Many babies cry from hunger because the nurse, physician, or mother is so obsessed by the fear of overfeeding that the baby is half starved. "I have yet to see a baby who cries because of overfeeding," said Professor Illingworth. Discomfort may occur from gas in the stomach, but most crying attributed to this cause is really due to hunger

The items in these letters are contributed by regular correspondents in the various foreign countries.

or boredom. Crying in the evening from 6 to 10 p. m. in a well-fed baby is usually due to colic caused by localized collections of gas in the intestine. Crying from discomfort may also be due to being too hot, too cold, or being wet or soiled. A most important cause of crying in babies is loneliness. This crying soon stops if the baby is picked up and cuddled—other types of crying do not.

In the older baby discomfort due to hunger continues but to a lesser degree than in the younger baby. Boredom is the most frequent cause of crying in the older child. Many babies are left to cry for hours in a carriage outside, with nothing but a brick wall to see, and their mothers cannot understand what is wrong with them. All the babies want is to see what is going on and to have company. Many such babies cease crying if they can watch their mothers. Other causes of crying in the older baby are forcible feeding, unaccustomed surroundings, inability to play, fatigue, and teething. In the older child most crying is related to the child's developing ego and negativism, or to his need for love and security. Forcing a child to do anything it does not want to do usually leads to crying. In the 1-year-old to 3-year-old age group, crying is often a device to attract attention. It is common at night through fear or night terrors. Insecurity from any cause—whether due to unhappiness, unkindness, impatience, excessive discipline, jealousy, or overprotection—leads to excessive crying in the young child. It is always increased by fatigue, boredom, or hunger. Intolerance and impatience in the parents must not be overlooked as a cause. The cause of the crying should be found and removed, because it is harmful to let a child cry for long periods without attending to it. It may make the baby sick and does psychological harm, leading to behavior problems in later life. Rigid disciplinarians breed unhappy children with no confidence in themselves or their parents. There is no evidence that it does any harm to a baby to pick it up when it cries; it does not cause a bad habit of expecting to be constantly picked up to develop. The young baby should be picked up when he cries but not when he is crying from fatigue and about to go to sleep. A baby that screams from colic, pain, or teething should be picked up and comforted.

Treatment of Poliomyelitis.—The British Orthopedic Association has recently issued a memorandum on the treatment of poliomyelitis. Until 1947 the disease was only sporadic in Great Britain, but in that year 7,000 cases were reported, and since then similar outbreaks have repeatedly occurred. The British Orthopedic Association is much concerned about arrangements for treatment during such epidemics. In the past the orthopedist was called in after deformity had developed. The increase in bulbar and respiratory complications has led to treatment by a team of experts, including anesthetists and laryngologists. This has resulted in the treatment of patients with poliomyelitis in general hospitals where the services of a team of experts are available rather than in infectious diseases hospitals, as was done in the past. The British Orthopedic Association regards this change with some alarm in view of the recent evidence of the high infectivity of poliomyelitis. Treating patients in general hospitals without isolation techniques may help to spread poliomyelitis. The association believes that the welfare of the community at large should not be jeopardized. It would be more reasonable to select suitable infectious diseases hospitals as centers for the treatment of poliomyelitis and to equip these hospitals with such specialist facilities as are needed for the present day treatment of the disease. In this way isolation is secured and specialist treatment is available to the patient.

The association also points out that unlike general hospitals, infectious diseases hospitals have no waiting lists and can admit patients immediately. There is not the delay or dislocation that occurs when a special unit has to be opened up in a general hospital to deal with a poliomyelitis epidemic. Administratively the infectious diseases hospital receiving patients with poliomyelitis can be linked with the general hospitals providing the specialist staff for the emergency treatment of the disease. It is also advisable for the appropriate orthopedist to be notified as soon as a patient with poliomyelitis is admitted to the infectious disease hospital, so that continuity of treatment by the surgeon is assured. He is also able to treat the paralysis in its initial stages when contractures often develop rapidly, to rehabilitate the patient, and to help settle him in a suitable occupation subsequently. The association suggests that the plan whereby orthopedic care commences at the beginning of treatment should be adopted on a national basis. The memorandum notes the recent tendency to emphasize the potentially lethal nature of poliomyelitis in planning treatment. While admitting that saving life is the first duty, most patients survive but with some degree of permanent crippling. Limbs must be saved as well as life. The infectious disease physician, the orthopedist and those qualified to deal with respiratory complications must all cooperate in treatment.

Influenza Prophylaxis.—In 1951 a committee on clinical trials for the prophylaxis of influenza was formed after collaboration between the Ministry of Health and the Medical Research Council. Tests in the winter of 1951-1952 resulted in a large scale field trial of a vaccine between 1952 and 1953. This vaccine was prepared from equal proportions of the strain FM_1 and the Liverpool strain, which was responsible for an epidemic in 1951. About 13,000 volunteers were involved in the trial, which showed that the vaccine afforded a 40% reduction in clinical influenza, compared with controls. As the results were encouraging a search for a more effective preparation was made. Reports from the United States indicated that a suspension of the virus in oil had greater antigenic properties than a suspension in isotonic sodium chloride solution, and a comparative serologic trial was started in December, 1953, with this preparation with volunteer medical students in London, Manchester, and Sheffield. This trial has confirmed the greater efficiency of an oil suspension for the first six months after inoculation. Reactions, both local and general, were negligible and were even less than those resulting from the conventional suspension in isotonic sodium chloride solution.

As an outbreak of virus A influenza might occur at any time, the committee has organized a further large scale trial with 16,000 volunteers from industrial areas scattered throughout the British Isles. Two oil vaccines and one conventional vaccine prepared from the England 1954 A strain will be tested, with a virus B vaccine as the control. After inoculation the volunteers will be observed carefully for four months, so that if outbreaks of influenza occur the protective value of the vaccines can be observed. The volunteers' own physicians will treat illness occurring during the four month observation period, and they will cooperate with industrial and other medical officers participating in the test. It is essential in the trial to distinguish between influenza and other upper respiratory infections. The general practitioners of the volunteers will be informed and will cooperate by filling in a record form. Medical officers of health in those areas where there are volunteer centers will be able to help by keeping general practitioners informed of influenza outbreaks in the district. An important innovation in this influenza trial is laboratory control. Some practitioners have agreed to take swabs from patients with suspected influenza for laboratory examination. This should enable the probable time of appearance and disappearance of influenza to be recorded and should make it possible to ascertain whether the epidemic is due to virus A or virus B.

Dental Caries.—A survey on the incidence of dental caries in children has been made by Dr. Geoffrey Slack at the University of Liverpool School of Dental Surgery. The condition of the teeth of nearly 2,000 children under age 5 attending day nurseries was noted over a period of four years. These children received good food, including a liberal supply of vegetables, cod liver oil, orange juice, and one pint of milk a day. No candy or snacks were allowed between meals at the nurseries, although there was no check on the food consumed at home. When present, caries was classified as: grade 1, cavities admitting the point of a dental probe; grade 2, cavities involving up to a third of the crown of the tooth; and grade 3, cavities involving more than a third of the crown. All fillings were recorded as cavities. The condition of the gums was noted and gingivitis classified as grade 1, 2, or 3.

The incidence of caries in the children was high. On reaching 5 years of age, the children had an average of five decayed teeth. In the first year the incidence was 10 to 20%, but it reached a maximum in the fifth year, when about 82% of the

children had an average of 4 or 5 teeth decayed, extracted, or filled. The school dental service, which is chronically understaffed owing to the low salaries paid, is thus faced with a problem of great magnitude. Twenty-six full-time dentists would be required in Liverpool alone to treat the teeth of all the children aged 4 to 5. Actually there are only 24 dentists to treat all the school children of Liverpool, and it is assumed that a similar situation exists elsewhere. The consequence is that many children become dental cripples. The solution does not lie solely in increasing the number of dentists, but in finding the cause of dental caries. There was an increase in the incidence of caries in one of the years of the study, and Dr. Slack attributes this to an increased consumption of candy, which ceased to be rationed after ten years. Three measures were recommended for reducing the incidence of caries: the fluoridation of drinking water, the rinsing of the mouth with water after meals, and an increased consumption of fibrous foods, such as apples, at the conclusion of a meal.

Fluoridation and Dental Decay.—After the announcement that public drinking water would be subjected to fluoridation in four districts, Drs. Dagmar Wilson and Hugh Sinclair, of the department of human nutrition, Oxford, have raised objections. They state that two little is known of the effect on the human body of the chronic ingestion of low concentrations of fluoride and of the level of intake at which retention in the body occurs in different people. Although it has been demonstrated without doubt that fluoride decreases the incidence of dental caries in children up to the age of 8 years, the effect on adults is less certain, they say. They argue that the fact that 14 million people in the United States are drinking water fluoridated to 1 ppm, without any demonstrable ill effects, proves nothing because dietary conditions differ in the two countries. In Britain large quantities of tea and sea food, both rich in fluorides, are consumed; these foods are unlikely to be used as much in United States. They also argue that the excretion of fluorides is not known in old people, whose intake of tea and hence fluoride is usually high. They find some evidence that fluorides are not excreted readily and accumulate in the body. If this is so, they argue, accumulation may occur in the body of elderly persons and in those persons with impaired renal function. Whether this accumulation is harmful or not is not known. Atmospheric pollution with fluoride has caused outbreaks of illness in sheep and cattle. Although not objecting in principle to the fluoridation of drinking water, they urge that more research should be done, particularly on fluoride storage and excretion and its mode of action in preventing dental decay.

Cigarettes and Cancer.—Drs. Cooper and Lindsey, with their co-workers at St. Bartholomew's Hospital, London, have demonstrated by chromatography and spectrometry the presence of polycyclic carcinogenetic hydrocarbons in cigarette smoke (*Chemistry and Industry*, pp. 1260, 1418, 1954; *Brit. J. Cancer* **8**:296, 1954). In addition to identifying anthracene and pyrene, these workers also detected 3,4-benzpyrene, a notorious carcinogen, in the tar of cigarette smoke and in the tar derived from both cigarette tobacco and cigarette paper. The conditions of the test and the temperature of combustion of the cigarettes resembled closely those occurring during the normal smoking of a cigarette. Drs. Cooper and Lindsey estimate that a person smoking 40 cigarettes daily for a year would inhale or absorb 150 mcg. of 3,4-benzpyrene and that at the same time he would absorb a further 200 mcg. from the average town air. They argue, however, that the benzpyrene in town air is adsorbed on particles of carbon and is largely inactive as a carcinogen, but the benzpyrene in cigarette smoke is in the form of a fine suspension in a solvent and, therefore, likely to be more active. This might explain the relative freedom of coal miners from lung cancer. They inhale benzpyrene, but it is adsorbed on fine particles of coal dust and inactivated. The smoke from cigarette paper contains far less benzpyrene than that from tobacco and is, therefore, presumably less carcinogenetic. These observations suggest that all forms of smoking, whether cigarettes, pipes, or cigars, carry the risk of the absorption of benzpyrene. It has long been thought that it was formed in the process of smoking, but until now it has never been proved.

The National Formulary.—The 1955 edition of the "National Formulary," sponsored by the British Medical Association and the Pharmaceutical Society of Great Britain, was compiled by a joint committee appointed by these bodies, and is designed as a guide to general practitioners and pharmacists. It is essentially a concise and dogmatic survey of current pharmacological teaching and a number of prescription formulas, some official and some not. Although it is not as authoritative as the "British Pharmacopoeia" or the "British Pharmacopoeial Codex," the abbreviation N. F. after a title, such as Lincture codeine fort., means that it will be recognized by the pharmacist and that it will be correctly dispensed. There is also a pharmacological classification of the preparations listed, so that all those containing a particular drug can be found together; also the range of preparations with similar pharmacological actions, e. g., analgesics, are grouped together. In a list of formulas arranged alphabetically, such information can only be obtained after a time-consuming search. There is a useful appendix of proprietary preparations, with their components or official equivalents, and the names of drugs or preparations that are substantially the same or are reputed to have analogous therapeutic effects. This is followed by a list of official or approved names of drugs and proprietary or other names given to them. The work has been brought up-to-date by the incorporation of new material and the deletion of 62 preparations. The formulary, given free to physicians, is popular in hospitals and in general practice, owing to its small size (it fits in a coat pocket) and useful formulas.

Junior Hospital Staff and National Service.—The Oxford Regional Hospital Board, which has experienced difficulty in obtaining a junior medical staff in some of its hospitals, is introducing a scheme designed to meet the needs of young physicians who, on completion of their national service, wish to extend their experience before entering general practice or taking up specialist training. Many such physicians, who are often aged 26 to 28, are married and are unable for financial and social reasons to take up short tenure hospital appointments. The Oxford scheme offers a limited number of rotating internships, tenable for two to four years, with a salary range of $2,070 to $3,010 a year to take the place of existing posts on the junior hospital staff, which are paid at a much lower rate ($1,470 to $2,086 a year). Efforts will also be made to provide housing for married physicians in or near the hospitals at a reasonable rental. Holders of these posts will be expected to serve for about six months each in the departments of medicine, surgery, obstetrics, and pediatrics and to assist in the other departments as circumstances demand. Most of the physicians holding these posts for two or more years will probably wish to enter general practice, and only a few will wish to train for a specialty. Opportunity will be given to selected candidates who have the necessary aptitude to train in special departments of their own or other hospitals in the region, retaining the salary increments in their grade.

The Nuffield Foundation.—The annual report of the Nuffield Foundation, established in 1943 to finance academic and medical projects in Great Britain and the Commonwealth, (The Nuffield Foundation: Report for the Year Ended March 31, 1954, London) states that the work financed by the foundation cannot be fitted into a single year, some of it not even into a five year period. The report in general covers the last five years. Research grants have aided projects on nuclear physics, the effects of aging, fetal physiology, malnutrition in Uganda, and many others. The first grant in the medical field was for the establishment of the Institute of Child Health of the University of London. The foundation has also established chairs in various branches of medicine. Industrial health departments were promoted in three universities in industrial areas. A chair of oral medicine was established in the University of Durham and research units in preventive dentistry in Leeds and Manchester. The foundation has particularly concerned itself with research in the rheumatic diseases and the care of the aged. Of the numerous fellowships, scholarships, and bursaries financed by the foundation, about a third are in medicine. In the last five years about $1,200,000 has been set aside for projects in the Commonwealth, where help is needed more than in Great Britain.

SWEDEN

Compensation Claims Against Physicians.—The Doctors' Liability Committee is a semiofficial body whose rulings are usually accepted as final, although appeals may be made to a higher tribunal. In one of these cases a 72-year-old man had a herniotomy performed by a junior member of a hospital staff. The femoral artery having been wounded during the operation, the operator was at a loss how to proceed, for he was not competent to undertake a suture of this vessel, and his senior was at the moment engaged on a resection of the stomach. No one being able to replace him at this moment, the case ended ultimately with amputation of the leg at the knee. In the opinion of the Liability Committee, the patient was entitled to compensation. In another case a 48-year-old man suffered on Feb. 11 from a complicated fracture of the basal phalanx of the right ring finger. The wound was sutured by a physician who waited till March 2 before making a roentgenogram of the finger. It showed a faulty position, and the patient was sent to a hospital, where the fracture was reset. The Liability Committee found that the physician had been negligent in delaying an x-ray examination, a delay that had prolonged convalescence, but the loss of 18 days claimed by the patient was held to be excessive, and he was awarded compensation for a maximum of 10 lost days. In a third case a sample of blood for a sedimentation rate determination was taken from a 41-year-old man by an experienced nurse, but the patient's hand became paralyzed. He claimed this to be the result of damage to a nerve inflicted by the operation. Rejecting this claim, the Liability Committee pointed out that this rare complication might befall anyone proceeding in the approved manner, and therefore the nurse could not be held to have been careless or negligent.

The King Gustav V Research Institute.—When the late Gustav V celebrated his 80th birthday, a national collection in his honor yielded 5 million Swedish crowns. At his request this sum was earmarked for the study of such crippling diseases as poliomyelitis and articular rheumatism. A 52-page pamphlet (Nordisk Rotogravye, Stockholm) printed in 1954 tells the story of this fund. A sum of 2,500,000 crowns was allotted to research and half a million to a reserve fund. The remaining 2 million crowns were invested in the Research Institute in charge of Prof. Nanna Svartz, one of the King's physicians. The grounds on which the institute stands are close to the Pathological Institute of the Karolinska Institute and its new department for patients suffering from rheumatic diseases. The Research Institute contains no hospital wards, and much of its space is devoted to laboratories. The provision for the accommodation of experimental animals is so generous that this part of the institute is like a zoological garden.

SWITZERLAND

Vital Statistics.—Statistical tables published by the World Health Organization on population trends in 30 countries from the beginning of the century (Epidemiological and Vital Statistics Report, vol. 7, no. 9, 1954) contain the latest information available on three major factors affecting the world's future development. This report is of particular interest at a time when population problems loom so large in the preoccupation of governments and international organizations, as recently emphasized at the World Population Conference in Rome. The report indicates that in most of the 30 countries studied, the general tendency had been towards steadily lower birth rates during the first years of the century, and in the years preceding World War II. Immediately after the end of the recent war, there was a spectacular increase of births that was followed by a drop in the birth rate. Despite this recent drop, data for 1953 reveal that birth rates remain definitely higher than they were before World War II, and this is especially the case in those countries in which the direct impact of the war was least. In other words, the fears often expressed in many countries, and especially in Europe before the war, of catastrophically lower and lower birth rates have proved unfounded, since the downward trend has been stopped.

The countries covered in the report show a continuous decrease in mortality; in some it has dropped by 50% in 50 years. Population levels are governed by the fluctuations of birth and death rates. With few exceptions a natural population increase is shown to be highest in those countries in which both birth and death rates are very high, but one country, the Netherlands, has always occupied a particular position among European countries, showing the highest birth rates coupled with a very low death rate; hence it has a natural population increase of a very high order. Certain reservations must be made with regard to the figures on crude birth and death rates. There are many possibilities of error in statistical tables covering widely different countries and giving retrospective data over long periods. The degree of accuracy in registration of births and deaths varies from one country to another and from one period to another. The figures therefore are not strictly comparable. In addition, population figures are sometimes unreliable, because of incomplete census or lack of exact statistics on migratory movements. Despite these reservations, however, it is believed that the trends indicated by the report are valid for the countries studied and may apply as well to other areas in which similar conditions prevail and for which no statistics are available.

Cortisone and Tuberculosis.—After several clinicians had warned of the danger of the use of cortisone in patients in whom tuberculosis was suspected and after experimental confirmation of the danger, certain authors have used a combination of antibiotics and cortisone in the treatment of tuberculosis anyway. M. Chauvet and P. Zumstein (*Schweiz. med. Wchnschr.* **84:**1209-1213, 1954), treating nine patients with serious forms of pulmonary tuberculosis or with miliary tuberculosis with pulmonary cavities and in whom the usual medical treatment had failed, gave them cortisone in addition to antibacillary agents. Four of these patients showed definite improvement, both clinically and radiologically. Two of these even showed bacteriological improvement. The five other patients in whom the tuberculosis had been present for many years and who had had several hospital admissions were improved only symptomatically by the addition of cortisone. Another patient with miliary tuberculosis, because of a severe intolerance to other drugs, was given cortisone alone and his lesions healed clinically and radiologically. These favorable results were probably due to the fact that cortisone diminishes the sensibility of the patient to tuberculin. At present the authors reserve this treatment for patients whose condition appears to be critical and who received no benefit from the usual forms of treatment.

Treatment of Poliomyelitis.—Professor Fanconi, head of the pediatric clinic of the University of Zurich, has organized a center for the treatment of the bulbar form of poliomyelitis modeled after the Danish centers. The indications for a mechanical respirator are becoming less frequent, and tracheotomy is made in order to permit the use of new types of instruments in aid of respiration. Several courses have been organized in order that all the hospitals of Switzerland will have sufficient trained personnel in the case of a new epidemic. Moreover, a national association has been founded, headed by Professor Gsell, in order to warn the population and the public authorities. This association will raise the funds necessary for the creation and equipment of other centers.

Lung Cancer and Tobacco.—Prof. O. Gsell has stated (*Méd. et Hyg.* **12:**429-431, 1954) that the incidence of lung cancer is six times greater in men than in women. This type of cancer is prevalent in the age group 45 to 54. The death rate from this cause in Switzerland has increased 32-fold in the last 50 years, but the death rate for cancer as a whole has only doubled in the same period. The correlation with smoking is striking. In Switzerland, the use of tobacco has increased 10-fold since 1924. The production of cigarettes has increased from 551 million a year in 1924 to 7,492 million in 1952.

Health Insurance.—In Switzerland, although health insurance is encouraged by the state, it is not obligatory. A bill has recently been proposed, however, to make maternity insurance obligatory for women between 19 and 50. This ominous move has as its principal aim paving of the way for obligatory insurance against disease.

CORRESPONDENCE

VIENNA BECKONS

To the Editor:—The famous school for postgraduate study in Vienna flourished for many years before World War I, carried fitfully on during the chaos of the 1920's and 1930's, and, finally, with the advent of Adolf Hitler, died. The clearing house for postgraduate medical studies was under the auspices of a society known as the American Medical Association of Vienna. Physicians from all over the world came there to study, the Americans being in the majority. It was truly an international organization and did much to cement friendship and understanding between doctors of every race, color, and creed. At no time in medical history were doctors more highly respected than in Vienna before World War I. With few exceptions they were very poor men, and the $5 for their lecture courses or instruction on the cadaver was a boon and afforded them better food and possibly a new suit of clothes. But if you walked down Alser Strasse or even the Ring Strasse and asked the first person you met, "Do you know Hajek?" a look of amazement would come over his face at the question. "Professor Hajek, the great Hajek, the father of the sinuses? Mein Herr, everyone knows Professor Hajek as they know the Pope, the Emperor or President Wilson." And the answer would be the same if the query were to Chiari, von Eiselsberg, Heindl, and Heinrich von Neumann. "Did you know, Herr Doktor, that a young prince of England is here in Vienna, being treated by Neumann?" It was a thrilling experience to be one of 10 in a class taught by Neumann. Unlike most of the teachers, he could not carry on a conversation in English outside of class. His lectures, however, were given in English, meticulously prepared, and at no time did he refer to notes.

If you were a young American doctor and had the good luck to get a chair in the nose and throat clinic, you met Rosie. Rosie was the clinic nurse. She was a large woman, almost 6 ft. tall and weighing well over 200 lb. She had a lovely complexion, sparkling brown eyes, and was as light on her feet as an elf. When you first met Rosie she was humming "Alexander's Ragtime Band," accompanied by a barely perceptible dance step. This was more than slightly disturbing to serious-minded Americans in the city of Beethoven, Schubert, and Brahms. A Strauss waltz or even Lehár's "Merry Widow" would have been quite all right, but American ragtime was too much. However, they soon got used to the aberrations of the true Viennese and settled down to the business of the day. Rosie seemed to be just in the right place if a young doctor needed help. When the bronchoscope failed to enter the right cavity and the doctor was shaken and sweating, Rosie would gently press on the tube and miraculously the instrument was exactly in position. Neumann never failed to credit the hard-working nurses of Vienna with making original observations in the care of patients, thus making it possible for medicine to advance. When Rosie was a young nurse at the children's ear clinic she drew the attention of the staff to the night cries of children in the third week of that dread disease, tuberculous meningitis; thus nailing down a symptom that found its way into medical literature. When World War I broke out, Rosie, no longer young, was one of the first on the eastern front. However, she was still vigorous and strong, and her name and fame were spoken of at many a campfire. During the first winter, she volunteered with others to bring in some Russian wounded who were in a barn a few miles away. Shortly after they left, a bitter wind sprang up from the icy steppes and blew into a raging blizzard. The next day a relief party found the Austrians and Russians all dead and buried in a great snow drift. Rosie had a young Russian strapped to her back. His legs had been shattered. There was a quiet smile on her face. She had gone to meet the children of the ear clinic. This time she would stay with them forever.

Several years ago, Dr. M. Arthur Kline of Boston gave up his practice to devote his time to reviving the former American Medical Association of Vienna, now known as the American Medical Society of Vienna. In his capacity of executive secretary, he has worked tirelessly to once again focus the world's attention on Vienna as a great medical center. His able assistant in this work is Mrs. Engel, the very same "Fräulein" so well known to hundreds of American doctors who studied in Vienna in the 1920's and 1930's. The newly decorated rooms of the society are just opposite the university, and from the windows one can see that delicate, lace-like work of modern Gothic, the Votive Church, and in the distance the spire of the 600-year-old St. Stephen's Cathedral.

Living expenses in Vienna today for a doctor and his family are about half of that in America. The courses, cadaver, and clinic work cost little, and the teaching is under world-famous men. If his children attend school, they will converse readily in German within a few months and the parents will discover they have more respect for parental authority. If the distaff side has a literary bent, she could find material for a novel or short stories. Mary Roberts Rinehart, while living in Vienna with her husband, who studied at the clinic, wrote her loveliest story, "The Street of the Seven Stars."

After several months or a year spent in intensive study the doctor will be entitled to a *Zeugnis* or diploma and can apply for the much prized Golden Key of the University of Vienna. When Dr. Kline got to Vienna all memory of the Golden Key had been lost. With the help of one or two American friends and a diligent inquiry all over the city, it was found that the engraver had died early in the war. But the die was found. Dr. Max Thorek, secretary general and founder of the International College of Surgeons, and Dr. Austin Smith, Editor of THE JOURNAL, were given the first two honorary keys. Each year three honorary keys will be given to distinguished physicians the world over.

The Viennese are a poor people, but they draw from a long tradition and a life in which values are real and immediate. And the Americans, most of all visitors, are aware that these hard-working folk have a fuller, wiser, happier life than others who are engorged with varieties, entertainments, and comforts. They have a strength that may appear casual, but it is based on deep religious convictions from which they have never swerved. Nowhere can one find the 13th century and the present so intimately bound together. "God's greetings, Herr Doktor," from the little shopkeeper and kindness and courtesy startle those who have just left a brassy civilization behind them.

Vienna beckons to all doctors—the young intern, the doctor who has completed his residency of four or five years in a large hospital, the professor, or he who has gotten his training the hard way, slowly, laboriously, and by prolonged apprenticeship. All can benefit by several months or a year spent in study in Vienna. It seems appropriate, then, for the World Medical Association to hold its annual congress in Vienna, Sept. 20-26, 1955. It will be a delightful occasion for doctors to sample once again Viennese medicine and for the families to enjoy the beauty and hospitality so evident in Vienna.

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MECKEL'S DIVERTICULITIS

To the Editor:—In THE JOURNAL for Jan. 1, 1955, page 77, a letter appeared criticizing my article "Pathognomonic Abdominal Sign for Meckel's Diverticulitis," in THE JOURNAL, March 27, 1954, page 1083. I appreciate the writer's interest but must take exception to some of his remarks. These are that (1) rectal hemorrhage is not a cardinal sign of Meckel's diverticulitis but of a peptic ulcer in a Meckel's diverticulum, (2) the "alleged pathognomonic sign" is possible in other abdominal diseases and not only when a Meckel's diverticulum is connected with the umbilicus, and (3) this sign cannot be expected to contribute to a lowered mortality rate from Meckel's diverticulitis—as "waiting for it to appear would prove disastrous." To answer each of these criticisms: 1. It would seem apparent that whenever a

Meckel's diverticulum is in any way involved in disease that inflammation (mechanical, bacterial, mycotic, viral, etc.) must be part of the microscopic picture: thus, the addition of "itis" to diverticulum to indicate a broad group (speaking both of gross and microscopic pathology) under the classification of Meckel's diverticul*itis*. I do not believe that the pathology of peptic ulcer anywhere in the intestinal tract would exclude an inflammatory reaction: as a matter of fact, in addition to the inflammation of a peptic ulcer in the duodenum itself, an inflammatory reaction is invariably present even in an organ (stomach) some distance from the active pathological process (gastritis). 2. Umbilical signs present in other abdominal diseases, such as in acute pancreatitis (Johnston's sign) and in the intra-abdominal hemorrhage of ruptured ectopic pregnancy (Cullen's sign), consist of changes in the umbilicus very different from the cellulitis described in my paper. Any other umbilical signs caused by cellulitis from separate origin were excluded in the article by a differential diagnosis that took into account the fact that the umbilicus in these cases was abnormal from birth. 3. Nowhere in my paper is it suggested that the attending physician should wait for this sign to appear before attempting diagnosis and treatment. On the contrary it is clearly stated that the sign must be "unfortunately, rarely seen."

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REACTIONS FOLLOWING USE OF NASAL DECONGESTANTS

To the Editor:—Several years ago a nasal decongestant was introduced under the name of Privine (2-naphthyl-methyl-imidazoline). While its local effects were satisfactory, it was found to produce a rather undesirable side-reaction (Waring, J. I.: *J. A. M. A.* **129:**129 [Sept. 8] 1945. Greenblatt, J.: *J. Pediat.* **31:**355, 1947). Small infants, particularly those under one year of age, would go off into a profound slumber, from which it was difficult to arouse them. While this soporific effect wore off in several hours, it caused a considerable degree of apprehension in the parents and also in the physicians who prescribed the medicament, for the latter were never certain which infant might develop this disturbing condition. Recently a new nasal decongestant has been introduced under the name of Tyzine (tetrahydroxoline hydrochloride) (Parish, F. A.: *M. Times* **82:**917, 1954). The 0.1% solution is available both as drops and in a plastic squeeze bottle. The instructions that are included in each package do state that caution in the administration of the nose drops and spray should be employed because of soporific side-effects. Recently I have prescribed Tyzine, both in drops and nasal spray, for a number of children, including six infants between the ages of 6 and 12 months. One of the infants, aged 10 months, has had difficulty sleeping since birth. Barbiturates, antispasmodics, chloral hydrate, and paregoric have at best had slight and transient effects in aiding sleep. After one instillation of Tyzine drops in the nose the infant slept for 14 hours and was roused with difficulty when the mother became alarmed. The other five infants showed the same soporific effects, although to a lesser degree. The chief cause of concern was the inability to rouse the infants until the sedation wore off. It must be acknowledged that the use of the spray, while apparently simpler to administer to a struggling infant, may be fraught with a greater degree of danger. If the infant, instead of being held upright, is treated in the supine position, the solution may pour into the nose in a stream and thereby introduce a much greater dose than is desirable.

A colleague of mine had a more alarming experience with a 7-month-old infant. Tyzine drops had been instilled in her nose at night for a mild nasal congestion. Early the next morning, the infant had marked respiratory embarrassment, resembling laryngeal edema. This child was sent to a hospital and placed in a Croupette humidity and oxygen tent with oxygen. The respiratory rate returned to normal within an hour, although the sedative effects took several hours to wear off. A personal communication with the manufacturers of Tyzine disclosed that soporific effects have been reported to them but not to the degree noted in the above-mentioned case. They were confined to the infants under one year of age, corresponding to the group reported here. Analysis of the manifestations in the six infants under my care revealed no effects other than sedation. There was no vomiting or diarrhea. The respiratory rate was neither slowed nor accelerated. The pulse rates remained within the limits of normal, considering that these infants were suffering from respiratory infections, with temperatures ranging from 98 to 103 F. While no blood pressure determinations were made, the quality of the pulse remained good. Because of the undue soporific effect produced, it was deemed advisable to present this short report and to remind physicians to warn their patients of the possible side-reaction.

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To the Editor:—Recently I had a disturbing experience. I sprayed 0.1% Tyzine nasal solution in the nose of my 22-month-old daughter for an acute upper respiratory infection. Within 30 minutes the entire skin of the child began to go dead white, and in an hour she went into complete vasomotor collapse, with a total loss of consciousness into a flaccid state. There was a dead white color, irregular sighing respirations, and a weak thready pulse. No cyanosis was present. All reflexes were absent. A bilateral Babinski sign was present. Epinephrine hydrochloride, 1:1,000 solution, 0.4 cc., was given subcutaneously, followed immediately by 0.25 gm. caffeine sodium benzoate by hypodermic and 15 minutes later by 0.25 gm. more of caffeine sodium benzoate. Each injection provoked a weak cry. Shortly after the injections wakefulness appeared, with control of voluntary muscles and a bit of voluntary walking and talking. At this point all reflexes were normal and the Babinski sign disappeared. Upon placing the child in a recumbent position the flaccid state and eye muscle dissociation would quickly reappear, but a sitting or standing position would somewhat relieve this collapse state. In less than another hour the coma-like state reappeared, to last at least an hour or more. About four hours after the initial administration of Tyzine, teeth grinding appeared. At the five hour point an emesis occurred, to be followed in the next four hours by four more emeses, one bowel movement, and two urinations, all under voluntary control, showing reactivation of gastrointestinal motility. Approximately seven hours from the outset of therapy a crisis seemed to be reached in that respirations became more regular, color began to reappear in all skin areas, and blood pressure began to rise from an initial level taken three hours after the medication of 100/60 to 120-130/60 mm. Hg. At the nine hour point sleep was obtained for two hours. At the 12 hour point a meal was eaten with relish, and except for obvious tiredness and sleepiness the child seemed normal and has been normal since.

Since this occurrence I have discovered that two more such reactions have occurred locally; in each case Tyzine had been used just prior to the reaction and each case was with a different pediatrician. In 1950 two patients were hospitalized at the Children's Hospital here with like reactions from Privine according to Dr. Clement Molony. Privine hydrochloride and Tyzine hydrochloride are very similar chemical compounds, are used clinically in the same concentration, 0.1%, and are extremely potent sympathomimetic amines. In checking plastic spray bottles, at least 1 cc. or more is expelled with each squeeze of the bottle. There are two lessons that the medical profession should be immediately informed about from my experience: Some agents for local application to the nasal membrane can cause severe reactions in children with inflamed membranes, and spray medicaments should not be used in children, as the dosage given cannot be judged and may be far greater than the average amount given by dropper. In collaboration with the departments of pediatrics and pharmacology I intend to test this medicament on monkeys with inflamed nasal membranes and to study toxicity of this compound.

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OLDER STUDENTS IN GERMANY

To the Editor:—A number of medical historians in the United States and in Germany have made the suggestion that I might seek the help of THE JOURNAL in connection with an historical problem concerning American medicine that I am investigating. As Fulbright Professor in Germany this year, I have been investigating the impact of German upon American medicine in the important years from 1870 to 1914. I am especially interested in the activities of American doctors and medical students in German-speaking countries during this period, i. e., where they studied, in what numbers, for how long, with what professors, what they thought of German university and scientific life, what their German professors and fellow students thought of them, and finally what influence these returning doctors had upon the development of American medicine. Since information of this nature is so very difficult to come by, it has been suggested that I might ask the help of older doctors who studied in Germany themselves during this period through the pages of THE JOURNAL. On the other side, I have recently had published a brief notice in the "Kleinere Mitteilungen" section of the *Deutsche medizinische Wochenschrift,* asking older German doctors for any memories they may retain of American students of this period.

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HEMATOLOGICAL COMPLICATIONS IN A CASE OF POLYCYTHEMIA VERA TREATED WITH DARAPRIM

To the Editor:—Daraprim (pyrimethamine) is a drug that is now used as an antimalarial. Its action is similar to that of the aminopterin class of folic acid antagonists. It has been subjected to a number of studies in animals and human beings. In the former it was found to lower the number of red and white blood cells in the peripheral circulation. Inconstant, minor lowering of the white blood cell counts in human beings has been noted but with no clinical consequence. Recently investigators have reported success in the treatment of polycythemia vera with this drug. Much of the latter work is as yet unpublished. Isaacs (*J. A. M. A.* **156:**1491 [Dec. 18] 1954) recently reported on the treatment of six cases without adverse effect with a dose as high as 50 mg. daily. The following case is reported because of the appearance of significant toxic manifestations. In view of the likelihood of anticipated widespread use of this drug following the favorable report referred to above, this report is being submitted without delay. It is likely that precautionary measures will suffice and that the drug will continue in its usefulness.

In a patient, aged 41, polycythemia vera diagnosed by adequate observation had been treated by several modalities with moderate success in control of symptoms. Radioactive phosphorus (P^{32}) had only transient effect. Repeated venesections were used chiefly. Because of favorable results, similar to those noted by Isaacs, in other patients (Erf, L. A.: Personal communication), therapy with Daraprim, in doses of 50 mg. daily, was started. The initial blood picture was as follows: hematocrit, 61; erythrocytes, 6,900,000 per cubic millimeter; and leukocytes, 17,000 per cubic millimeter. After 20 days of therapy with Daraprim these features were noted. Anorexia, mental dulling, generalized nasal bleeding, widespread purpura throughout, mucosal ulcerations in the mouth, leukopenia (leukocytes, 2,800; 40% granulocytes) presented a perplexing group of manifestations in a very ill patient. Therapy with the drug was stopped; corticotropin (ACTH) and folic acid were given. By the fifth day the white blood cell count had risen to 5,000 per cubic millimeter, with 50% granulocytes. Bleeding manifestations continued, but no further oral ulcerations were noted. Ultimately the hemorrhagic manifestations cleared, the ulcerations healed, and the white blood cell count returned to its former levels.

It may well be that the initial dose of drug administered was too high and that lower dosage would not have been followed by the hemorrhagic, ulcerative, and leukopenic manifestations noted. It is pointed out, however, that others have given such doses over much longer periods without toxic manifestations. Most important of all is the fact that Daraprim has the toxicity that might be expected of it. All the reports of its use in human beings emphasizing its innocuous nature are probably based on the fact that its use has not as yet been sufficiently widespread to have indicated such effects. It may well be that small doses, when used as a successful antimalarial, will not result in the above picture. On the other hand, large doses, currently employed in the treatment of polycythemia vera, will likely produce additional cases of toxic condition as reported. It may well be that simple withdrawal of the drug might have sufficed. It is suggested that therapy of polycythemia vera be started with smaller doses and that the patient be observed hematologically and clinically at weekly intervals for the early treatment period. Now that the side-effects are apparent they should be easily recognized.

It is only because everyone who has used this drug has been impressed with its innocuous nature that this patient was not seen until he had taken the drug for three weeks and had developed severe manifestations. Undoubtedly, toxic manifestations would have been recognized earlier had the physician been warned of this possibility. The therapeutic value of Daraprim in this patient subsequently became apparent despite the above-described reactions. His hematocrit and red blood cell count are normal at the time of this writing. Generalized pruritus had been a distressing symptom for several years and had failed to respond to any other known treatment for polycythemia vera. For the first time, he is completely free of this distressing symptom.

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ACUTE RENAL FAILURE

To the Editor:—My experience with the management of acute renal failure has, in general, coincided with the reported experience of Swann and Merrill (*Medicine* **32:**215, 1953). Along with these authors, I have taken a conservative attitude toward treatment, with only infrequent resort to any dialysis method, then only to relieve the accumulation of potassium, the most frequent cause of death in patients with lesions that are presumed to be reversible. The various reported methods of dialysis create problems of serious import. The artificial mechanical kidneys entail numerous hazards and, in most hands, operate with uncertain efficiency and considerable expense. Peritoneal lavage requires large quantities of sterile solutions, an abdominal surgical wound, and considerable discomfort for the patient. Gastric lavage also is uncomfortable for the patient and relatively ineffective because of the small dialyzing surface. Lavage of an isolated small intestinal loop has been suggested, but this, again, involves surgery in a patient whose general condition discourages the surgeon.

It occurred to me that the colon might offer a satisfactory site for dialysis, through the medium of the Harris flush technique, with a minimum of patient discomfort and few of the potential complications that accompany the dialysis methods listed above. This idea is so simple and so obvious that it seems to me someone must have tried it before this; nevertheless, no such trial has come to my attention; I stand ready to be corrected. This technique of colon lavage has been used in two patients with favorable results. The conventional Harris flush technique was used, but the flush was continued for 30 minutes out of each hour, with sessions from 12 to 24 hours long. After the reservoir had been raised and lowered four times, the flush solution was replaced with fresh solution of the desired composition. A log was kept of the total fluid volume administered and retrieved, so that any deficit remaining within the colon could be estimated. The composition of the dialyzing flush solution was varied as required through knowledge of the serum electrolyte composition, determined twice daily. The necessary electrolytes were added to tap water to make the dialyzing flush

solution desired. The daily consumption of orally and parenterally given fluids was modified, during the period of dialysis, to allow for the estimated amount of fluid retained in the colon. Significant improvement in electrolyte status was obtained in both patients with this procedure. For example, in one patient, at the end of a 24 hour period of dialysis by the Harris flush technique, the serum potassium concentration was lowered from 7.6 mEq. per liter to 6.7 mEq. per liter, the serum sodium concentration remained at 132.3 and 131.0 mEq. per liter, the serum carbon dioxide content was raised from 13.4 to 17.8 mM. per liter, and the serum chloride concentration was raised from 97.0 to 101.4 mEq. per liter. Similar results were obtained in the second patient.

Acute renal failure is not so common that I can test a series of patients with this procedure in a reasonable time. For this purpose, I thought it would be desirable to call the method to general attention, since my limited experience had favorable indications. The procedure imposed no discomfort at all upon the patients, except for a little rectal irritation at the end of a full 24 hour period of irrigations. It is of interest to note that Marcelle Dunning and Fred Plum (University of Washington School of Medicine) reported significant potassium washout by enemas in one case, with the inadvertent production of profound hypokalemia, at the Jan. 27, 1955, Carmel, Calif., meeting of the Western Section, American Federation for Clinical Research.

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TRICHOMONAS VAGINALIS

To the Editor:—I read with interest the article by C. H. Davis on Trichomonas vaginalis in The Journal, Jan. 8, 1955, page 126, since I have been experimenting with T. vaginalis and T. vaginitis since 1932. I have found that the use of a nonlubricated vaginal speculum to scrape off the secretion from the vaginal walls and this secretion removed from the speculum with two cotton applicators is better for the diagnosis of trichomonads. In reply to the statements "Having decided against the further use of acid preparations" and "vinegar douche with a pH of 3 produced no visible effect on T. vaginalis," by detailed electronic pH recordings it was found that the normal vaginal pH was from 3.5 to 4.2, which is decidedly acid. If acids are not as good as alkaline preparations then one might assume that the normal very acid vagina might be abnormal; also, I have inoculated trichomonads into a normal vagina, pH 4.0, and all of the trichomonads died. If the vagina was scratched and the same culture of trichomonads inoculated, the trichomonads grew and kept the vagina at a pH near 6. When the vagina was again normal the pH return to 4.

The vinegar, with a pH of 3, combined with a vaginal secretion caused by T. vaginalis, with a pH of 6, gives a resulting pH of near 6, not 3. This is caused by the highly buffering property of all vaginal secretions. It has been observed with electronic pH machines that one of the most overlooked factors in the treatment of vaginal and cervical leukorrheas is the buffering property of these leukorrheas. If enough vinegar with a pH of 3 is added to trichomonal leukorrhea until the pH is 4, then no trichomonads would have been found. I was the first person to write about vinegar douche in the American medical literature, but at that time I did not know about the buffering properties of vaginal and cervical leukorrheas. Since the observation about buffering properties of vaginal and cervical leukorrhea, I have made up a normal physiological buffered vaginal douche. It is known as Amfrecin. Also, a correctly buffered and acidified vaginal powder and tablet have been developed. This preparation contains the correct amounts of spreading agents and detergent; sugars, glucose, and lactose; as well as fungicides, trichomonacides, and bactericides. This is known as baculin. Monilia grows if only a trichomonacide is added. Spreading agents must also be added to vaginal medicaments due to the presence of a "moist layer" that prevents older medicaments from ever reaching the epithelial surface and especially into the areas between the folds of the vaginal epithelium. I have tested hundreds of different chemicals, both quaternary ammonium compounds and spreading agents and by observing their action on the trichomonads under the microscope. The trichomonads were very easily killed, but, when placed in the vagina, the trichomonads were vigorous, living, freely motile, unharmed, and swimming around as if nothing had been added to the vagina.

There is no comparison chemically between the test tube with trichomonads in it and trichomonads in vaginal secretion in a vagina. What a chemical will do in a test tube and in a vagina may vary markedly. New chemicals are produced when a chemical is added to a vagina. There are carbohydrates, fats, proteins, enzymes, vitamins, trace elements, minerals, serum, buffers, etc., in a vagina that are active, but in secretion removed from the vagina these factors begin to fade away. It has been found that most chemical reactions in secretion removed from the vagina last, in regard to pH changes, about six minutes. It was found years ago and retested with the newer medicaments and found that no douche solution alone will eradicate all trichomonads in the vagina, regardless of the composition, if this is the only way that this vagina is being treated. Powder (baculin) has been found to be the best.

It was also stated by Dr. Davis that "application of sugar is unnecessary." I have found that sugars added to medicaments for the vagina and cervix serve three purposes: these sugars are fermented into acids, causing the vagina to be more acid; they have adhesive properties in the vagina; and they absorb leukorrhea and odors. In resistant cases the use of vitamin B complex and ascorbic acid plus trace elements (cevron), plus increasing and large doses of micronized vitaminized desplex stilbestrol, for about four weeks is necessary. Vaginal epithelium requires extra estrogens and vitamins when it is infected.

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CORONARY HEART DISEASE IN LABORERS AND FARMERS

To the Editor:—At the Feb. 9 television broadcast on coronary heart disease, sponsored by the American Medical Association and Smith, Kline and French, I presented in the closing discussion a few patients illustrative of the frequently good prognosis after coronary thrombosis or serious coronary insufficiency. These patients represented different racial backgrounds and occupations that did not, however, include those of farmer or heavy laborer. As a practicing physician in a large medical center I do not myself have as much contact with farmers or heavy laborers as many of my viewers may have or as many other physicians living so far from the larger cities that they may not have attended the broadcast session. I and many of my colleagues, I am sure, would appreciate hearing of the personal experience of physicians practicing in rural areas or in industries where they see many farmers, other agricultural workers, foresters, and heavy laborers. I have been told that in New Zealand coronary thrombosis is quite common among the dairy farmers. It is to be expected that many hardy workers in such states as Vermont may not consult a physician until they are much sicker than those nearer the large medical centers. I would be interested in knowing how frequently physicians who have such experience encounter coronary heart disease among farmers, lumberjacks, and heavy laborers. Is coronary heart disease more common among dairy farmers than among dirt farmers or among heavy laborers in the city than among heavy laborers in country and forests?

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GOVERNMENT SERVICES

ARMY

Colonel Black to Be Administrator of Coal Miners' Hospital.—Col. Robert Lee Black, retiring chief of the Medical Service Corps of the Army, has been appointed administrator of the Memorial Medical Center in process of construction at Williamson, W. Va., one of three key central hospitals in the chain of 10 general hospitals being built in the coal fields of southeastern Kentucky, southern West Virginia, and southwestern Virginia to meet the needs of coal miners and their families who are beneficiaries of the United Mine Workers Welfare and Retirement Fund. As administrator of the Memorial Medical Center, Colonel Black will have over-all responsibility for the operation of three smaller, affiliated hospitals in the surrounding area, those at McDowell and Pikeville, Ky., and at Man, W. Va. The more highly specialized facilities and services for the group of four hospitals will be concentrated in the Memorial Medical Center at Williamson. The initial total bed capacity of the four hospitals will be 330 beds, with expansion possible to about double this capacity.

During his Army career, Colonel Black had extensive experience in the prewar period in hospital administration. In World War II he served as Chief of Medical Supply for Army Forces in England and in 1945 as Chief of Medical Supply for all Army Forces in Europe. In 1948 he became Assistant Chief of Personnel for the Army Medical Service on the staff of the Surgeon General in Washington.

Influenza Commission Meets in Ann Arbor.—The Armed Forces Epidemiological Board's Commission on Influenza held its annual meeting March 17-19 at the University of Michigan, Ann Arbor. The commission, composed of military and civilian doctors, discussed the progress made against influenza in the past year. Director of the commission is Dr. Thomas Francis, University of Michigan School of Public Health, Ann Arbor. Eleven commissions compose the Armed Forces Epidemiological Board, which concerns itself with epidemics and epidemic diseases. Each of these commissions will meet during the spring. Executive secretary of the board is Col. Adam J. Rapalski, M. C., Research and Development Division, Office of the Army Surgeon General.

PUBLIC HEALTH SERVICE

A New Insecticide.—A new insecticide has been discovered by research scientists at the Savannah, Ga., laboratory of the Public Health Service's Communicable Disease Center. The discovery is in the organic phosphorous insecticide field, and its name, DDVP, is derived from the initials of its chemical name, dimethyl dichlorovinyl phosphate. Its very high potency was illustrated recently in a large dairy barn where there was a high fly population known to be resistant to chlorophenothane (DDT). The flies were reduced to nearly zero in less than four hours by 8 gm. of dimethyl dichlorovinyl phosphate where it was estimated that it would have taken 10,000 gm. of chlorophenothane. The Savannah research team has shown that the new insecticide is much safer for animals and man than other organic phosphorous insecticides now in use. Since dimethyl dichlorovinyl phosphate is an organic phosphorous insecticide, a different chemical family not previously considered as substitutes for chlorophenothane and its related compounds, its discovery opens up a whole new class of economic poisons.

The discoverers believe that dimethyl dichlorovinyl phosphate will prove useful also against several pests of agricultural crops, especially mites and aphids. Because of its high volatility, the new product, unlike chlorophenothane, will not remain effective over long periods of time. Thus, it will be especially suitable on crops where insecticide residues are objectionable. The Savannah laboratory, which has been doing research in fly control for years, is a part of the Communicable Disease Center, located in Atlanta, Ga., under the direction of Dr. Theodore J. Bauer.

SECRETARY OF DEFENSE

Meeting of Canadian Advisory Committee.—The Canadian government invited a number of Army, Navy, and Air Force officers and members of the National Research Council to the annual meeting of the Canadian Defense Medical Research Advisory Committee in Toronto late in February to review the year's progress in medical research. The chairman of the committee is Dr. Charles H. Best, director of the Banting and Best Department of Medical Research at the University of Toronto. This advisory committee, along with the Canadian Defense Medical Research Coordinating Committee, is a part of the Canadian Defense Research Board, the counterpart of which in the United States is called the Office of the Assistant Secretary of Defense, Research and Development. The two Canadian committees are responsible for meeting the research and development medical needs for the Canadian military services. The Canadian Research Board has 16 medical research panels that represent the board in the field of medical science.

MISCELLANEOUS

Technical Editors and Writers Wanted.—The U. S. Civil Service Commission announces an examination for technical editors and writers for duty with various federal agencies in Washington, D. C., and vicinity, including, among others, the Naval Medical Research Institute, the Naval Research Laboratory, the Naval Training Publication Center, the Air Force, Army, Department of Interior, Veterans Administration, and the Department of Health Education and Welfare. Technical editors and writers perform or supervise the writing, editing, revision, and preparation of manuscripts for publication in pamphlets, circulars, manuals, reports, bulletins, or magazines. They may also write or edit summaries or histories of research projects; make recommendations on format, illustrations, and style; make recommendations to authors or officials on improving the quality of manuscripts; and plan and coordinate writing and editorial projects.

The salary is based on the federal work week of 40 hours and ranges from the basic entrance salary of $3,410 (GS-5) to $10,800 (GS-15), with periodical increases. Applicants must be at least 18 years of age, citizens of the United States, and physically able to perform efficiently the duties of the position. A physical examination will be made by a federal medical officer before appointment. Applicants must pay their own expenses in reporting for duty and also their expenses in returning home if on reporting at the place of assignment they are found ineligible because of physical defects. Preference benefits based on honorable separation from the armed services are given under certain conditions in competitive examinations for original appointment. All applicants must fill out form 57 and 5001 ABC and show the title of the examination, the number of this announcement (No. 3B, issued Feb. 15, 1955), and the lowest salary they are willing to accept. These forms may be obtained from any post office except in cities where a Civil Service Regional Office is located, and in those cities the forms can be had from the regional office. The forms, when filled out, should be filed directly with the Executive Secretary, Board of U. S. Civil Service Examiners for Scientific and Technical Personnel of the Potomac River Naval Command, Naval Research Laboratory, Washington 25, D. C.

Physicians Wanted for Indian Service.—The U. S. Bureau of Indian Affairs needs physicians to staff the 58 hospitals that it operates chiefly in the Western states and the territory of Alaska. These hospitals, which vary in size from 16 to 420 beds, are for the care of eligible medically indigent Indians. Service in the smaller hospitals offers the general practitioner an unusual opportunity, while the larger hospitals offer specialists a similar rewarding experience in the specialties. These hospitals serve an estimated medically indigent Indian population of about 200,000. Civil Service medical officers are rated from GS-11 to GS-15, with corresponding salaries from $5,940 to $10,800. Inquiries accompanied by brief summaries of professional qualifications should be addressed to the Chief, Health Branch, Bureau of Indian Affairs, Department of the Interior, Washington 25, D. C.

LAW DEPARTMENT

MEDICOLEGAL ABSTRACTS

Autopsies: Exhumation of Body to Determine Cause of Death.—The Mutual Benefit Health and Accident Association filed an application requesting disinterment of the body of a deceased person so that an autopsy could be performed thereon. The application was resisted by the widow. From an order granting the application, the widow appealed to the Supreme Court of Iowa.

On Jan. 20, 1952, the deceased was involved in an automobile accident resulting in a broken leg and a bruised arm, shoulder, and chest. He died four days later and was buried on Jan. 28. The attending physician diagnosed the primary cause of death to be cerebrovascular accident and a secondary cause to be pneumonitis. Under an Iowa statute, a state court may order disinterment of a body on proper request for the purpose of holding an autopsy thereon to determine the cause of death.

The Supreme Court stated that an application for disinterment should not be granted unless the facts showed, among other things, that there was a reasonable likelihood that an autopsy would determine the cause of death and hence reveal facts critically pertinent to the respective claims of the parties. At the hearing the expert medical testimony on this question was somewhat contradictory, primarily because there was a suggestion of the possibility that an adequate embalming job was not performed on the deceased since he had poor circulation. The expert witness for the insurance company, a pathologist of wide experience, stated repeatedly that it was reasonably probable that an autopsy would disclose the condition that caused decedent's cerebral hemorrhage. The widow's expert witness, apparently younger and less experienced, said, "I doubt very seriously that an autopsy at this time would be conclusive." He did admit, however, that if the embalming was adequate the autopsy would probably reveal any one of several recognized causes of cerebral hemorrhage such as brain tumor, arteriosclerosis, and traumatic injury to the brain. The Supreme Court held that this evidence was sufficient to support the lower court's finding that an autopsy would probably determine the cause of the decedent's death. The court also held that the decree ordering the disinterment was too broad in defining the limits of the autopsy. The decree stated, in part, that the pathologist performing the autopsy may remove those parts of the body necessary for an adequate examination; but all such parts must be restored to their normal place in the body, "except only such portions thereof as may be necessary to be subjected to microscopic examination. . . ." The court said that the quoted portion of the above statement should be stricken, and the following should be inserted: "except only shavings or such slivers of tissue as may be necessary to subject to microscopic examination." The term autopsy, said the court, has a settled medical meaning, and the decree as amended did not authorize anything to be done over and beyond what is accepted as good medical practice in the performance of autopsies. The Supreme Court pointed out that the right to have the body remain undisturbed is not absolute and must yield where the demands of justice require such subordination.

Accordingly, the Supreme Court affirmed the order of disinterment as modified. (*In Re Disinterment of Body of Jarvis, 58 N. W. (2d) 24 (Iowa, 1953).*

Malpractice: Liability of United States for Negligence of Army Surgeons.—This was an action for damages for injuries allegedly arising out of the negligent treatment and care given the plaintiff while she was a patient at De Witt General Hospital, which was operated by the medical department of the War Department. The case was heard in the United States district court, northern district, California.

In 1945 the plaintiff, a civilian employee at De Witt General Hospital, was suffering with varicose veins in her legs. Col. William Smith, commanding officer of the hospital, admitted her as a patient for an operation that was performed by staff physicians, who were medical officers on duty at the hospital. Subsequently, the plaintiff developed a phagedenic ulcer. At the trial expert medical testimony was given to the effect that the physicians in charge of the plaintiff failed to make a diagnosis of infection when certain symptoms appeared within one week after the operation; that an adequate examination was not performed on the plaintiff to determine the cause of her infection until 70 days after the operation; and that antibiotics were not administered to plaintiff until one month after the operation and then not in sufficient quantities. The testimony further showed that this manner of caring for the plaintiff did not then meet the standard of the practice of medicine and surgery.

In reaching a decision, the district court held that, even though Colonel Smith lacked actual authority to admit the plaintiff, yet it was an act within the scope of his employment. This conclusion was based on the facts that Colonel Smith was in charge of the management of the hospital, was responsible for determining which patients should be admitted, and was acting on behalf of his principal's interests. The court further found that the evidence warranted a finding that the physicians did not exercise the degree of skill, care, and knowledge in this case that was ordinarily possessed and exercised by members of their profession under similar circumstances. This failure was chargeable to their principal, the United States.

Accordingly, the court entered judgment in favor of the plaintiff. *Canon v. United States, 111 F. Supp. 162 (U. S., 1953).*

MISCELLANY

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OSLER'S THREE IDEALS

I have three personal ideals. One, to do the day's work well and not to bother about tomorrow. It has been urged that this is not a satisfactory ideal. It is; and there is not one which the student can carry with him into practice with greater effect. To it, more than to anything else, I owe whatever success I have had—to this power of settling down to the day's work and trying to do it well to the best of one's ability, and letting the future take care of itself.

The second ideal has been to act the Golden Rule, as far as in me lay, toward my professional brethren and toward the patients committed to my care.

And the third has been to cultivate such a measure of equanimity as would enable me to bear success with humility, the affection of my friends without pride, and to be ready when the day of sorrow and grief came to meet it with the courage befitting a man.—(The Life of Sir William Osler, by Harvey Cushing.)

THE OATH OF THE HINDU PHYSICIAN

(Circa 300 B. C.?)

You must be chaste and abstemious—Speak the truth—Not eat meat—Care for the good of all living things—Devote yourself to the healing of the sick even if your life be lost by your work—Do the sick no harm; not even in thought—Seek not another's wife or goods—Be simply clothed and drink no intoxicant—Speak clearly, gently, truly, properly—Consider time and place—Always seek to grow in knowledge—Do not treat women except their men be present—Never take a present from a woman without her husband's consent—The physician should enter a house accompanied by a man suitable to introduce him there—He must pay attention to all the rules of behavior in dress, deportment, and attitude—Once, with his patient, he must in word and thought attend to nothing but his patient's case and what concerns it—What happens in the house must not be mentioned outside—Nor must he speak of possible death to his patient, if such speech is liable to injure him or anyone else—In face of gods and man, you can take upon yourself these vows—May all the gods aid you if you abide thereby—Otherwise may all the gods and the sacra, before which we stand, be against you, and the pupil shall consent to this, saying, so be it.

THE EULOGY OF SIRACH

(Apochryphal Book of Ecclesiasticus)
(38:1-15; Third Century A. D.)

"Honour a physician with the honor due unto him for the uses which ye may have of him; for the Lord hath created him.
For of the most High cometh healing, and he shall receive honor of the king.
The skill of the physician shall lift up his head; and in the sight of great men he shall be in admiration.
The Lord hath created medicines out of the earth; and he that is wise will not abhor them.
Was not the water made sweet with wood, that the virtue thereof might be known?
And He hath given men skill, that He might be honored in His marvelous works.
With such doth he heal (men), and taketh away their pains.
Of such doth the apothecary make a confection; and of his works there is no end; and from him is peace over all the earth.
My son, in thy sickness, be not negligent; but pray unto the Lord, and He will make thee whole.
Leave off from sin, and order thy hands aright, and cleanse thy heart from all wickedness.
Give a sweet savour, and a memorial of fine flour; and make a fat offering, as not being.
Then give place to the physician, for the Lord hath created him;
Let him not go from thee, for thou hast need of him.
There is a time when in their hands there is good success.
For they shall also pray unto the Lord, that He would prosper that, which they give for ease and remedy to prolong life.
He that sinneth before his Maker, let him fall into the hands of the physician."

THE OATH AND PRAYER OF MAIMONIDES

(Maimonides—Islamic Philosopher and Sage of Cordova)
(1135-1204 A. D.)

Thy Eternal Providence has appointed me to watch over the life and health of thy creatures. May the love for my art actuate me at all times: May neither avarice, nor miserliness, nor the thirst for glory, nor for a great reputation engage my mind; for the enemies of truth and philanthropy could easily deceive me and make me forgetful of my lofty aim of doing good to thy children. May I never see in the patient anything but a fellow creature in pain. Grant me strength, time, and opportunity always to correct what I have acquired, always to extend its domain: For knowledge is immense and the spirit of man can extend infinitely to enrich itself daily with new requirements. Today he can discover his errors of yesterday and tomorrow he may obtain a new light on what he thinks himself sure of today. O God, thou hast appointed me to watch over the life and death of thy creatures: Here I am ready for my vocation.

And now I turn unto my calling:

O stand by me, my God, in this truly important task: Grant me success: For—without thy loving counsel and support, man can avail but naught. Inspire me with true love for this my art and for thy creatures, O, grant that neither greed for gain, nor thirst for fame, nor vain ambition, may interfere with my activity. For these I know are enemies of truth and love of men, and might beguile one in the profession from furthering the welfare of thy creatures. . . . O strengthen me. Grant energy unto both body and soul that I might ever unhindered ready be to mitigate the woes. Sustain and help the rich and poor, the good and bad, enemy and friend. O let me ever behold in the afflicted and suffering, only the human being.

THE EULOGY AND COUNSEL OF THEODORIC

(King Theodoric the Great)
(454-526 A. D.)

Among the most useful arts which contribute to sustain the faith of human nature, none can be placed above or on an equality with medicine; it ever assists the sick with material benevolence, it banishes our pains. Desist, O Practicer of the medical art, from contests that injure the patient, and if you are not able to be in accord, consult someone who can be interrogated without envy because every prudent man wants to seek counsel and he is considered the best who through frequent calls has been proved to be the wisest. In the beginning of this your art, you are consecrated by oath similarly to the priest; promise solemnly to your masters to hate iniquity and to love honesty. Remember that to sin in connection with the health of a human being is the crime of homicide. And while I honor you with the title of Comes Archiatrorum (Archiatri=Physicians) to the end that those best esteemed among the masters of the healing art shall call upon your judgment, your advice to be just arbiter in this chosen art . . . to the expert the pulse reveals what are the internal afflictions and to his eyes the urine. Enter freely our palace, with full trust.

ROBERT LOUIS STEVENSON'S TRIBUTE TO THE PHYSICIAN

There are men and classes of men that stand above the common herd—the soldier, the sailor, and the shepherd not infrequently; the artist rarely; rarelier still, the clergyman; the physician almost as a rule—he is the flower (such as it is) of our civilization; and when that stage of man is done with, and only to be marveled at in history, he will be thought to have shared as little as any in the defects of the period, and most notably exhibited the virtues of the race. Generosity he has, such as is possible to those that practice an art, never to those who drive a trade; discretion, tested by a hundred secrets; tact, tried in a thousand embarrassments; and what are more important, Herculean cheerfulness and courage so that he brings air and cheer into the sickroom, and often enough, though not so often as he wishes, brings healing.

The following editorial is reprinted with permission from the Wall Street Journal.—ED.

SHOES FOR BABY

Tax Outlook, issued by the Tax Foundation which keeps pretty close tab on what's happening to the taxpayers' dollar, contains in its February issue some . . . quotes from a Government publication . . . "Your Children's Feet and Footwear."

The booklet, put out by the Department of Health, Education and Welfare, can be obtained from the Superintendent of Documents, U. S. Government Printing Office, for ten cents. It contains such sound observations as these:

"Before he begins walking, a baby really doesn't need any covering for his feet—except possibly to keep him warm in cold weather."

"When a child is learning to walk, he needs to have shoes that allow him to make natural use of his feet."

"The widest part of the shoe should fit the widest part of the foot."

"The time to replace shoes is when the child has outgrown them."

Well it seems to us that there is a lot more the Department of Health, Education and Welfare might tell its readers about children and shoes. First, most children have parents, who usually come in pairs. One is called Mother. She picks out the shoes. The other is called Father. He picks up the tab. There are other differences, too, between them. Mother thinks comfortable shoes are necessary for growing children and Father, but personally she prefers a rather snug fit herself. Mother agrees that the time to replace shoes is when they're worn out, but Father, like the Tax Foundation, knows that new shoes for baby is generally a gamble on what the tax collector leaves in his sock.

Another thing the Government booklet didn't tell us is that shoes, like parents, generally come in pairs. That's because they are made for people and people usually have two feet. Shoes also come one for the left foot and one for the right foot because people's feet come that way.

And it's a good thing they do, at that, because if both feet turned the same way people would be wasting their time going around in circles, like some Government Departments.

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Does Mitral Stenosis Recur After Commissurotomy? R. P. Glover, J. C. Davila, T. J. E. O'Neill and O. H. Janton. Circulation **11**:14-28 (Jan.) 1955 [New York].

The authors' entire series of nearly 600 consecutive commissurotomies, performed over a period of five years, has been exhaustively reviewed in an effort to provide factual information on the fate of the incised valve during this initial period of observation; its ultimate fate will, of course, remain unknown for years to come. The twofold purpose of commissurotomy is to enlarge the mitral orifice and to restore valve leaflet mobility to the fullest extent permitted by the scarring of the valve tissue. Complete anatomic separation of the fused valvular cusps from the stenotic orificial rim out to the annulus is, therefore, the ideal requirement for an adequate commissurotomy, but in some cases the severity of the pathological changes in the valve tissues will make it impossible to attain. Failure to secure an adequate separation probably accounts for the isolated instances in which restenosis has apparently followed an operation on the mitral valve. A review of the 42 deaths that occurred during the late postoperative period in the authors' series showed that in 5 cases the cause of death was unknown, while in not one of the remaining 37, in which there was an adequate follow-up, could death be attributed to the recurrence of mitral stenosis. The longest survival after a technically adequate commissurotomy among these patients was 36 months. Similarly, examination of the autopsy records that were available for 31 patients, of whom 20 died within the first 24 days and 11 in from 1 to 18 months after the operation, revealed no evidence of recurrent stenosis. Serial sections of the valves showed little or no evidence of true endothelialization of the cut surfaces, no evidence of active rheumatic valvulitis, and no evidence that any process that might lead to mechanical occlusion of the mitral orifice had occurred. A careful clinical appraisal of 7 patients who were operated on from 4½ to 5½ years ago and who are therefore among the patients with the longest postcommissurotomy survival periods now living also failed to support the presumption that restenosis of the mitral valve might have occurred in any one of them. Five of these patients obtained and have maintained an excellent functional result and are living an active normal life without cardiac medication. The sixth patient is improved, but her ultimate functional status cannot now be completely assessed. The seventh patient, though alive and able to assume minor household duties, is essentially no better than she was before the operation, because in her case extensive calcification prevented the execution of an adequate commissurotomy. The fact that the obvious functional improvement that was obtained in approximately 75% of the patients in this series is not routinely reflected in the objective cardiac findings can readily be understood when it is remembered that commissurotomy is performed for the relief of a mechanically strictured mitral valve. Rheumatic stigmas and changes present in the myocardial and valvular tissues before the operation obviously remain after it, and, if the patient's subclinical rheumatic state continues, they may even progress. Patients whose mitral valves have been properly opened with resultant relief of hypertension of the left atrium, pulmonary vessels, and the right side of the heart, however, are far better able mechanically to cope with their rheumatic condition, and this is why so much stress is laid on the importance of early operative intervention, before the cardiopulmonary changes have advanced to the stage at which they are on the verge of becoming irreversible. No signs that either complete or partial restenosis had followed an adequate commissurotomy were found in any of the cases here reviewed.

Sclerodermic Heart Disease. J. Fabre, G. Kostopoulos and E. Engel. Arch. mal. coeur. **47**:941-958 (Nov.) 1954 (In French) [Paris, France].

Sclerodermic heart disease, though usually regarded as an exceptional condition, appears in more than one out of four cases of cutaneous sclerosis, and the possibility of its presence in patients with scleroderma should be investigated by clinical, radiological, and electrocardiographic examination of the heart. A review of 21 patients with scleroderma treated at the Cantonal Hospital of Geneva showed 11 patients with obvious heart disease, which was caused essentially by the scleroderma in 4 and by sclerodermic involvement of the myocardium combined with other factors in 2; in the remaining 5, complicating conditions, such as arteriosclerosis, arterial hypertension, acute rheumatic fever, and syphilis, offered a sufficient explanation of the cardiovascular disturbances. The clinical picture of sclerodermic heart disease seen in these patients and 41 others reported on in the literature is essentially that of heart failure in which the signs of left ventricular decompensation predominate. Dyspnea is, therefore, the earliest and most obvious symptom, but it is usually supplemented by venous stasis, hepatomegaly, and edema. Cardiac enlargement resulting from dilatation can often be seen on radiological examination, and signs of myocardial change are constantly apparent in the electrocardiograms. Histological study shows degeneration of the myocardium characterized by progressive replacement of the muscular fibers with collagenous tissue, infiltration of the arterial walls leading to myocardial ischemia and the production of cicatricial areas, myocardial atrophy resulting from nutritional disturbances, and, secondarily, endocardial or pericardial thickening. These degenerative changes in the myocardium are no doubt the primary cause of the heart failure in scleroderma, but other factors, such as pulmonary sclerosis, which increases the work of the right ventricle or a tight sclerotic covering over the chest interfering with respiratory movement and thus preventing normal oxygenation of the blood, may also contribute to its development. Substantial remissions can sometimes be obtained by the usual methods of treating congestive heart failure, but sooner or later the condition becomes resistant to treatment and ends in death.

The Effect of Hexamethonium upon Cerebral Blood Flow and Metabolism in Patients with Premalignant and Malignant Hypertension. C. W. Crumpton, G. G. Rowe, R. C. Capps and others. Circulation **11**:106-109 (Jan.) 1955 [New York].

The effect of hexamethonium bromide on cerebral hemodynamics and metabolism was studied in 13 patients, aged 28 to 48, with severe hypertension, none of whom had previously been given hexamethonium. Grade 3 hypertensive retinopathy was present in six of the patients and grade 4 in seven. Mild to moderate impairment of the renal function was demonstrated by standard clinical tests, but blood nonprotein nitrogen value was within the normal range. Four of the patients had suffered a cerebral vascular hemorrhage from six months to one year before. Cardiac functional capacity was 1-2. Control measurements were made, and hexamethonium was then administered intramuscularly in a mean average dose of 1 mg. per kilogram of body weight. The mean arterial blood pressure fell within from 5 to 30 minutes. The second blood flow determination, made 60 minutes after the injection, when the blood pressure had become stabilized, showed a drop in the mean arterial blood pressure from 181 to 111 mm. Hg, or a decrease of 39%. Cerebral vascular resistance was reduced 29%. Cerebral blood

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The place of publication of the periodicals appears in brackets preceding each abstract.

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flow fell from 55 to 46 cc. per 100 gm. per minute (16%). The cerebral oxygen consumption, which did not change significantly in spite of the reduced blood flow through the brain, was maintained at the expense of a reduction in cerebral venous oxygen saturation, indicating a decrease in the ability of the cerebral circulation to meet the metabolic needs of the brain, which was only partially compensated for by the decrease in cerebral vascular resistance. Comparison of these results with those of other workers suggests that the most likely explanation for the reduction in cerebral vascular resistance lies in direct action by hexamethonium on the cerebral blood vessels. The authors' findings, taken in conjunction with those of Dewar, seem to indicate that the mean arterial blood pressure should not be abruptly reduced with hexamethonium by more than 30% of the control value in patients with either premalignant or malignant hypertensive vascular disease.

Objective Evaluation of Coronary Vasodilator Drugs. H. I. Russek, B. L. Zohman and V. J. Dorset. Am. J. M. Sc. **229:**46-54 (Jan.) 1955 [Philadelphia].

Russek and associates during the past five years have attempted to evaluate 16 different agents by recording and comparing the specific effects of each on the electrocardiographic response to standard exercise in carefully selected cases. They found that glyceryl trinitrate (nitroglycerin) in therapeutic doses exerts a strikingly favorable effect on the response to exercise as recorded electrocardiographically. Papaverine in a dose of 1 to 2 grains (65 to 120 mg.) given intravenously or 3 to 8 grains (200 to 518 mg.) given orally in some patients decreases or abolishes the abnormal electrocardiographic response to standard exercise. Such benefit is not, however, observed with usual therapeutic doses of this drug. Of all the agents tested, pentaerythritol (Peritrate) tetranitrate remains the most effective drug currently available for prolonged prophylactic therapy in angina pectoris. A 10 to 20 mg. dose affords protection for four to five hours, as judged from the two-step test in the majority of patients studied. The results obtained with triethanolamine (Metamine) trinitrate biphosphate, dioxyline (Paveril) phosphate, and Nitroglyn (glyceryl trinitrate in specially coated granules), respectively, were in sharp contrast with those observed after the administration of Peritrate. Metamine was found to exert little or no significant effect on the electrocardiographic response to standard exercise. Paveril, in some cases, improved the exercise response, but its action was not sustained even with massive dosage. Paveril appeared to be a much less potent drug than papaverine. Nitroglyn, in spite of the logic behind its use, gave disappointing results. Aminophylline, Roniacol (beta-pyridyl-carbinol tartrate), tolazoline (Priscoline) hydrochloride, tetraethylammonium chloride, octyl nitrite, visammin (khellin), heparin, and bishydroxycoumarin (Dicumarol) appeared unimpressive when evaluated with this method. Ethyl alcohol, in 1 to 2 oz. (30 to 60 cc.) amounts, fails to influence the electrocardiographic response to exercise, although it does prevent or reduce the severity of anginal pain. Alcohol should be classified as a rapidly acting sedative and should not be prescribed as a coronary vasodilator drug. Morphine is identical to alcohol in its effect on pain and in its failure to modify the exercise response. Of the drugs tested, only glyceryl trinitrate, papaverine, and pentaerythritol (Peritrate) tetranitrate appear worthy of continued clinical use as vasodilators in the management of angina pectoris.

Temporal Arteritis: Fatal Case. A. Frassineti and V. Rizzini. Sett. med. **42:**565-570 (Oct. 31) 1954 (In Italian) [Florence, Italy].

A 75-year-old man complained of blindness in the left eye, which he had noticed accidentally 20 days earlier when he was in bed for an influenza-like condition, with mild fever, asthenia, and bitemporal headache. The headache was preceded by a prickling sensation consisting of a burning and pulsating pain along the course of the superficial temporal arteries. Although continuous, it had always been tolerable and without exacerbations. The general condition of the patient was poor, and the arterial pressure was 170/90 mm. Hg. Bilaterally the temporal arteries were prominent and tortuous, painful, and not pulsating; the skin over them was red and edematous. After bilateral periarterial infiltration with procaine, the headache decreased and the local inflammatory process subsided. But a slight headache appeared at the back of the neck, suggesting that the vertebral arteries had probably become involved. The eye condition was unchanged. A segment of the superficial right temporal artery was removed for diagnostic and therapeutic purposes. The postoperative course was normal, and the headache at the back of the neck disappeared almost entirely. The eye examination revealed progressive atrophy and no improvement in the visual function. The patient was discharged clinically cured 1.5 months after his admission and was able to resume normal life without further disturbances. He died suddenly, however, with symptoms of a bulbar paralysis about three months from the onset of the first signs of the disease and one month after his discharge from the hospital. Death was ascribed to the fact that the arteritic process had involved an encephalic, probably a bulbar, vessel. The clinical picture and the histological specimen—this with periarteritis, mesoarteritis, and endarteritis of a chronic granulomatous productive type and presence of giant cells and absence of eosinophils—were typical of temporal arteritis.

Adenoidal-Pharyngeal-Conjunctival Agents: A Newly Recognized Group of Common Viruses of the Respiratory System. R. J. Huebner, W. P. Rowe, T. G. Ward and others. New England J. Med. **251:**1077-1086 (Dec. 30) 1954 [Boston].

About two years ago Huebner and associates at the National Microbiological Institute and a group at Johns Hopkins University School of Hygiene embarked on collaborative efforts to study the undifferentiated respiratory diseases, including febrile catarrhs, exudative nonstreptococcic pharyngitis, primary atypical pneumonias, and the afebrile common colds. The plan was to utilize tissue culture techniques in efforts to demonstrate as yet unknown viruses from the respiratory tract that might have some relation to these illnesses. In a previous communication the authors reported isolations of a new agent in surgically removed human adenoids by growing of adenoidal epithelium in roller-tube tissue cultures. Shortly thereafter they found that similar agents could be demonstrated in the tonsils and adenoids of a majority of persons undergoing surgical removal of these tissues. Subsequently, by using tissue cultures of human embryonic epithelium and HeLa cells, they demonstrated more than 100 strains of viruses, biologically and serologically related to the adenoid-tonsil agents, in nasopharyngeal and conjunctival secretions and feces of patients with undifferentiated respiratory diseases. The authors present here in general terms their findings, which are given in greater detail in reports now in preparation. The new viruses are designated as adenoidal-pharyngeal-conjunctival agents. One hundred forty-three strains have been segregated into six immunologic types, and additional types probably exist. They are resistant to ether and antibiotics. In human beings and in rabbits they produce potent, type-specific neutralizing antibodies and lesser amounts of heterotypic responses. Complement-fixing antigens and antibodies produced in comparatively large amounts are group specific but not type specific. All six types cause infections in man. Serologic surveys in the Washington, D. C., area indicate that 50% of infants 6 months to one year of age have been infected with at least one type. By the age of 15 the average person has had infections with several types. Most persons have antibodies to four or more types by the age of 34, and a few have antibodies against all six types. There is evidence that types 3 and 4 cause specific respiratory illnesses. Type 4 (Hilleman and Werner's RI-67 agent) apparently produces respiratory illnesses in military personnel described as acute respiratory disease and primary atypical pneumonia. Type 3 has been recovered in numerous cases of acute nasopharyngitis and conjunctivitis. Types 1 and 5 have also been found in cases of acute pharyngitis, but more evidence is needed to establish the role of these and other types in human disease. Since these viruses have been isolated from adenoids and tonsils of a majority of persons undergoing tonsillectomy and adenoidectomy, a possible role in persistent chronic disease of tonsils and adenoids should be investigated. Possibly of more importance is the demonstration of viruses in tissues containing specific antibody against them by the simple expedient of growing the infected tissues for prolonged periods. This method of "unmasking" viruses represents a highly sensitive and essentially new technique for isolating viruses.

Outbreak of Febrile Pharyngitis and Conjunctivitis Associated with Type 3 Adenoidal-Pharyngeal-Conjunctival Virus Infection. R. H. Parrott, W. P. Rowe, R. J. Huebner and others. New England J. Med. **251**:1087-1090 (Dec. 30) 1954 [Boston].

On Feb. 11, 1954, a 2-year-old girl with acute febrile rhinitis, pharyngitis, and conjunctivitis was admitted to the infectious disease service at the National Institutes of Health, as a subject in the study of acute respiratory illnesses. During her admission examination she coughed in the face of the pediatrician, in whom, six days later, mild rhinitis, pharyngitis, and unilateral conjunctivitis developed. Eight days after the admission of this child, the pediatric nurse who attended her and a 7-year-old girl who occupied the other bed in her hospital room also had febrile pharyngitis. During the next week similar cases of fever with rhinitis and pharyngitis occurred in an ambulatory adult patient and in two ambulatory pediatric patients. Another pediatrician had rhinopharyngitis without fever 13 days after admission of the first patient. This paper describes the clinical features of the illness in these eight patients and the evidence in each of them of infection with a newly recognized viral agent, adenoidal-pharyngeal-conjunctival virus, type 3. The symptoms in descending order of frequency included pharyngitis, rhinitis, fever, cervical or submandibular lymphadenopathy, conjunctival inflammation, and tenderness of the liver. At least six of the eight patients had symptoms and signs that were strikingly similar. The two physicians had symptoms that were similar but less severe and of shorter duration. The facts that all these cases were associated by direct or indirect contact and that the illness in each began within a limited period further suggest that the illnesses were manifestations of a distinct clinical and epidemiological entity. All eight patients gave evidence of infection with type 3 virus. From five the virus was recovered during the acute stage of illness, and antibody responses were demonstrated during convalescence. Two others, from whom materials for isolation were not available, showed rise in antibody titer during the illness. Virus isolation in one case was accompanied by an elevated neutralizing antibody titer (over 1:16) during convalescence, no serum specimen being available from the acute stage for comparison. The authors point out that the prototype of adenoidal-pharyngeal-conjunctival virus, type 3, was isolated from a human volunteer during studies on the common cold. This virus has also previously been isolated from the eye of a laboratory worker with unilateral conjunctivitis similar to that in one of the cases presented here. Thus, the data in this report, as well as those reported in separate communications, suggest that type 3 virus is capable of causing febrile or nonfebrile rhinitis, pharyngitis, and conjunctivitis. However, further clinical and epidemiological studies are necessary to test this hypothesis.

Use of Ganglioplegics in Experimental Tetanus. G. Brancadoro and S. Visconti. Gior. ital. chir. **10**:830-835 (Oct.) 1954 (In Italian) [Naples, Italy].

Among the latest successful methods used in the treatment of tetanus is artificial hibernation. The authors' experiments have indicated that good results can also be obtained with the administration of ganglioplegics or the "lytic cocktail." Sixty guinea pigs were inoculated with a minimum lethal dose of tetanus toxin; one-half of them were then given Largactil, chlorpromazine [10-(γ-dimethylaminopropyl-2-chlorophenothiazine hydrochloride] or a lytic solution. By blocking the ganglionic synapses these drugs interrupt the transmission of the nervous stimuli, lowering as a consequence the threshold of excitability and therefore placing the subject in a state of biological passivity. Lowering of the metabolism, blocking of the thermotaxic centers, relaxation of the muscles, and slowing up the circulation are the aims of the symptomatic treatment of tetanus. The symptoms appeared more slowly and were milder at the onset in the guinea pigs that had received the drugs. Death was delayed by as much as 15 days in the animals given the drugs. This seems to be the logical consequence of the attenuation of symptoms brought about by the ganglioplegics. It may be that the organism of these animals was placed in the condition to effect an immunologic defense for a longer time and with a more intense action. Although antitoxin therapy still retains all its value in the treatment of tetanus, the administration of ganglioplegics may be useful in attenuating the symptoms of this grave disease.

Contraindications of Cortisone in Treatment of Brucellar Arthritis: Preliminary Report. R. A. Cosarinsky Elinger. Rev. Asoc. méd. argent. **48**:419-420 (Aug. 15-30) 1954 (In Spanish) [Buenos Aires, Argentina].

Observations were made by the author on several patients with brucellar arthritis that rapidly grew worse after administration of cortisone. Pain, edema, and asthenia greatly increased, and nervous excitation and insomnia appeared. The results of the Signorelli reaction for Brucella showed an extraordinary loss of the bactericidal power of the blood. The author shows by illustrations the development of Brucella in four culture tubes. Cultures in the first and fourth tubes were 48 hours old. They corresponded, respectively, to a culture of brucellas in the Stafshet's medium and a positive Signorelli reaction in a patient with brucellosis who had not had cortisone therapy. Cultures in the third and fourth tubes were 18 and 9 hours old respectively. They showed the extremely increased positive Signorelli reaction in two patients with brucellosis who had had cortisone therapy. The cultures grew so exuberantly that they surpassed older cultures prepared with the Stafshet's medium that is elective for Brucella. The author believes he is first to report the untoward effect of cortisone on brucellosis. American investigators published in 1952 results of experiments on two large groups of mice infected with Brucella suis. Animals in one group did not have cortisone therapy, whereas those in the other group had received the drug. Brucellosis was mild in animals in the former group and fulminant in those in the latter. The liver was the seat of very acute lesions. The development of Brucella was so great that the organism invaded even the Kupfer's cells. The experiments are mentioned because they give an experimental support to the results of clinical observations in this preliminary report. The author concludes that cortisone should be interdicted in the treatment of brucellar arthritis as the drug hinders the organic reactions of immunity, causes loss of the bactericidal power of the blood, and lowers to zero the blood opsonic index.

The Results of Medical Treatment of Peptic Ulcer. C. A. Flood. J. Chronic Dis. **1**:43-50 (Jan.) 1955 [St. Louis].

A long-term follow-up study of patients who received conservative treatment for gastric or duodenal ulcer was begun at the Presbyterian Hospital in New York about 20 years ago. The patients were seen periodically at intervals of six months or oftener to record the variations in the course of the disease. It was hoped that the accumulated data would serve as a basis for comparison with the results of surgical treatment and for reference in the evaluation of newly proposed remedies for peptic ulcer. Most of the patients were initially hospitalized for a period of intensive treatment. Medical therapy consisted chiefly of frequent bland feedings, moderate amounts of alkalies between feedings, mild sedation, and, at times, antispasmodics during active symptoms and for a period of time thereafter. Reassurance and assistance in environmental readjustment were attempted when feasible. After discharge from the hospital, the patients followed a restricted diet and took medicaments for variable periods. In a group of 233 patients with duodenal ulcer the pain disappeared entirely within two weeks in 74% of patients. Occult blood, when present in the stools, rarely persisted for more than 10 to 14 days. The average healing time of gastric ulcer, and probably also of duodenal ulcer, is approximately six to seven weeks. The basis for symptomatic intractability or delayed healing is often difficult to evaluate, although emotional factors may play a role. In general, the immediate results of medical therapy for uncomplicated gastric or duodenal ulcer are satisfactory. The author found that 78% of his patients with duodenal ulcer experienced one or more recurrences during the subsequent five years of medical management. Of 101 patients treated medically for gastric ulcer, all but two persons ultimately had a recurrence. The recurrence rate in this series of patients approximated once every two years in both gastric and duodenal ulcer. The long-term outlook is largely unpredictable in a given patient. However, a slow initial symptomatic response to therapy is a bad prognostic sign. The risk of recurrent hemorrhage after an initial bleeding episode was about once every six years in this series. After a second hemorrhage, the subsequent risk of bleeding was almost doubled.

It appears that a tendency to hemorrhage is an anatomic accident attributable to the location of the ulcer. The development of a gastric carcinoma was observed in 5 of 101 patients with evidence of benign gastric ulcer who were followed on a regimen of conservative therapy.

Thromboembolism. A. Ochsner. Rocky Mountain M. J. **51:** 1059-1062 (Dec.) 1954 [Denver].

Ochsner feels that the confusion in the treatment of thrombophlebitis is due to the fact that physicians generally have not differentiated between thrombophlebitis and phlebothrombosis. In thrombophlebitis the thrombus is caused by inflammation of the vein wall and changes in the vascular endothelium. The clot is firmly attached. For this reason, the patient with thrombophlebitis or phlegmasia alba dolens, although having severe symptoms, consisting of fever, pain, and swelling of the extremity, has a good prognosis as regards life. There is little danger of pulmonary embolism except in the relatively rare cases of suppurative thrombophlebitis in which infected emboli can break off. In phlebothrombosis, on the other hand, a coagulation thrombus occurs in a previously normal vein. Two factors are involved: first, the predisposing factor consisting of an increased coagulability resulting from changes in the blood constituents because of tissue injury, and, second, the precipitating factor, circulatory retardation. The thrombus is a coagulation or red thrombus, which is not firmly attached to the vein wall. Its relationship to the vein wall is similar to that of a coagulum appearing in a test tube when blood is allowed to clot. It easily becomes detached, with the production of either nonfatal pulmonary embolism or massive fatal embolism. Patients with phlebothrombosis have few or no clinical manifestations. The patient may have a sense of impending disaster. There may be an elevation of the pulse rate or tenderness along the course of the veins of the lower extremities, but in many cases of phlebothrombosis there are no clinical manifestations whatsoever. It is essential to differentiate between phlebothrombosis and thrombophlebitis, because not only are they different in their mechanism of production, their clinical manifestations, and their prognosis but they differ also from the standpoint of therapy. The patient with thrombophlebitis that is not complicated by infection does not die, but unless adequate therapy is instituted early, he is likely to have persistent sequelae that may plague him the rest of his life. The clinical manifestations are largely the result of vasospasm in the arterioles of the involved extremity. The paleness of the extremity, its coolness, and the pain are due to ischemia. If this is overcome by chemical interruption of the sympathetic impulses, there is a rapid relief. If the patient receives no treatment during the acute phase, the patient is likely to have persistent edema and other sequelae of venous stasis. Compression bandages are essential in the control of edema, and the patient should be mobilized as quickly as possible after the temperature has returned to normal. Phlebothrombosis must be treated radically and without delay. Ligation of the vein on the cardiac side of the thrombus is imperative. The use of anticoagulants might be of value prophylactically, but, once phlebothrombosis has occurred, anticoagulants have little or no place in the treatment of phlebothrombosis.

The Treatment of Hyperpotassemia: Some Observations on the Use of a Carbonic Anhydrase Inhibitor as a Therapeutic Aid. V. Moseley and N. B. Baroody. South. M. J. **48:**1-6 (Jan.) 1955 [Birmingham, Ala.].

Progressive weakness, increasing lethargy, drowsiness, muscular weakness of the extremities, diminished depth and force of respiratory muscle function, bradycardia, cardiac irregularities, and the development of signs suggesting impending cardiac failure are clinical findings suggestive of hyperkalemia. It is likely to be caused by prolonged oliguria, sodium depletion, excessive ingestion of potassium salts, hemolytic reactions, extensive traumatic injury to other cellular components, and fever or any other cause for an increase in tissue catabolism (dehydration, starvation, acidosis, anoxia, certain stress states, etc.). Hydration, replacement of sodium and chloride deficits, and the establishment of an adequate urinary output will correct hyperkalemia in most instances. When urinary output is diminished, the administration of dextrose solutions and insulin may prove to be of material benefit by causing potassium to be returned to the intracellular space. Along with these measures it is essential to withhold potassium-containing foods and fluids and to reduce catabolic activity to a minimum by providing an adequate caloric intake of a non-nitrogenous and potassium-free type. Dialysis with an artificial kidney is the best method of treatment when one is confronted with a patient showing signs of potassium intoxication and oliguria that cannot be quickly improved. The authors' experiences with intestinal and peritoneal lavage have convinced them of the efficacy of these two methods as substitutes for the artificial kidney, which is not always available. In patients with a reasonably good urinary output but persistent hyperkalemia, acetazoleamide (Diamox) may prove of value as a carbonic anhydrase inhibitor. Results have been good in the six patients who were treated with this agent up to the time of writing.

SURGERY

Extra-Auricular Mitral Valvotomy. H. Baden and F. Therkelsen. Thorax **9:**340-343 (Dec.) 1954 [London, England].

The routine approach to the mitral orifice is through the left auricular appendage, but in the three cases reported by Baden and Therkelsen the auricular approach could not be used. Two patients had no auricular appendage. In one of these patients valvotomy had been given up in another hospital, as the base of the appendage would not admit a finger. The operation was therefore restricted to amputation of the auricle. The second patient had undergone two years previously a mitral valvotomy and amputation of the auricular appendage. In the third case a right lower lobectomy and mitral valvotomy were carried out in one sitting by entering the atrium through the right inferior pulmonary vein. The authors feel that the easy course of the operations through the atrial wall largely depends on the development of a special technique for the closure. A purse-string suture is used to secure a tight fit around the finger during the finger fracture, while the closure is effected with two rows of stay sutures, placed parallel to the incision and tied in pairs as the finger is withdrawn. In an addendum to this report the authors state that they have performed four more extra-auricular mitral valvotomies. In three cases they went through the atrial wall proper using the technique described above. The indications for this approach were very small auricular appendages and/or appendages completely obliterated by organized thrombotic material. The operations and the postoperative course were uneventful in all three cases. On the fourth patient a right lower lobectomy for carcinoma of the lung was performed, and the mitral valve was approached through the right lower pulmonary vein. This patient died two hours after the operation. The autopsy did not explain the cause of death.

Operations for Coronary Artery Disease. C. S. Beck and D. S. Leighninger. Ann. Surg. **141:**24-37 (Jan.) 1955 [Philadelphia].

Five thousand experimental operations on the coronary blood vessels in dogs were done by the authors over the past 22 years. Emphasis is placed on the approach dealing directly with the blood supply to the heart. The direct approach stands out in contrast to any other methods in the study of coronary artery disease. The experimental work showed that surgical intervention protects the heart after a major artery is occluded. Two facts were established. 1. Mortality was reduced by the operation. 2. The infarct was reduced in size by the operation. These facts indicate that operative methods aid a crippled coronary circulation. Surgical intervention cannot cure the disease and it cannot restore degenerated myocardium. Patients in failure from degenerated myocardium are not acceptable for operation. Occlusion of a major coronary artery is a stimulus for the development of intercoronary arterial communications. The authors allow a period of six months to elapse after arterial occlusion before accepting a patient for operation, so that these protective channels will have developed before the operation. One of three courses may be taken after this six month period. 1. The patient may improve without operation. 2. The con-

dition may become static. 3. The disease may progress. If a patient in the second group is operated on it will be possible to estimate the benefit from operation by comparison of the preoperative with the postoperative condition. The trigger mechanism must be accepted in this new attitude towards coronary artery disease; a trigger is an ischemic area of myocardium that has the potential of sending out impulses that in turn destroy the normal mechanism. The destructive property of a trigger can be increased or reduced by 1 to 5 cc. of blood per minute, and surgical operation is beneficial if it can supply such a small quantity of blood to an ischemic area. Mechanism death and muscle death are the two types of death in coronary heart disease. Continued function is possible in the hearts of patients with coronary heart disease if the coordinated beat is not destroyed. This large group of patients are candidates for surgical intervention. The patients in whom extensive degenerative changes develop in the myocardium so that the heart enlarges and failure appears are not candidates for surgical intervention. Two surgical operations were developed as the result of the experimental work. They are referred to as the Beck 1 operation and the Beck 2 operation. The mechanism of benefit of operation 1 is provided by intercoronary arterial channels, which are produced by the inflammation on the heart resulting from placing powdered asbestos in amounts of 0.2 to 0.4 gm. on the heart and by partial sinus ligation. There are two principal mechanisms of benefit provided by Beck 2 operation in which a small vein graft is placed between the coronary sinus and the aorta. In the first six to eight weeks the backflow and the benefit are due to flow from the aorta through the graft, through the veins, and through the capillary bed. After eight weeks the intima of the veins thickens, and some of them become thrombosed. The retrograde flow persists, but it comes from intercoronary channels. Of 108 patients operated on between 1951 and 1953, death resulted from thoracotomy alone in 3 (2.8%); 8 patients (7.5%) who underwent the Beck 1 operation died, and 28 (26.1%) who underwent the graft operation died. In 1954, 23 patients were operated on; the mortality from thoracotomy was 4.3% and from both operations, 4.5%. The mortality has been reduced by experience, selection of better risk patients, and the preferred use of Beck 1 operation. Four out of five patients were improved by the operation, obtaining either complete relief from pain or pronounced reduction of pain.

Resection of the Thoracic Aorta with Replacement by Homograft for Aneurysms and Constrictive Lesions. D. A. Cooley and M. E. De Bakey. J. Thoracic Surg. **29**:66-104 (Jan.) 1955 [St. Louis].

Of 12 patients treated by resection of the thoracic aorta and replacement by homograft, the surgical intervention was made for aneurysms in 7 and for constrictive lesions in 5. In some patients grafts preserved in a modified Tyrode's solution were used for replacement, but in most patients freeze-dried or lyophilized grafts were used. Of the seven patients with aneurysm, five were men between 31 and 66 years of age and two were women aged 50 and 17 years respectively. In four men and in the older woman the aneurysm was of syphilitic origin; in one man the aneurysm was caused by trauma, and in the 17-year-old woman it was congenital. In these seven patients, the length of the graft varied from 7 to 30 cm. The period of aortic occlusion varied from 38 to 77 minutes. Three of the seven patients died; in two patients death resulted from shock within 6 and 12 hours, respectively, after the operation, and in one death resulted from septicemia on the eighth postoperative day. Excellent results were obtained in the remaining four patients. General body hypothermia was used in two patients in order to reduce the arterial oxygen requirements of the central nervous system and thus prolong the period of safe aortic occlusion and prevent postoperative paraplegia. Local cooling of only the spinal cord proper by local application of cold packs to the spinal column was used in one elderly patient in whom it was considered too risky to use general body hypothermia. Although the thoracic aorta was occluded for 53, 62, and 53 minutes, respectively, in none of the three patients was there evidence of paraplegia after the operation. Other means of reducing this hazard are concerned with the technical procedure itself, which is described in detail. Of the five patients with constrictive lesions, four were males between 12 and 35 years of age and one was a 29-year-old woman. The constrictive lesion was acquired (arteriosclerotic) in one man and congenital in the other four patients. Excellent functional results were obtained by all the patients. For fusiform aneurysms and constrictive lesions of the descending thoracic aorta resection of an extensive segment of the aorta may be necessary, making end-to-end anastomosis impossible. In such cases restoration of aortic circulation may be achieved by insertion of vascular homografts. The degree of ischemic damage to the spinal cord occurring during periods of temporary aortic occlusion is influenced by a number of factors, including the duration of occlusion, extent and location of the lesion, and extent to which collateral circulation exists. In patients with constrictive lesions the collateral circulation is usually well developed, and temporary aortic occlusion may be tolerated for indefinite periods. In patients with aneurysms, however, in whom collateral circulation is poorly developed, successful performance of aortic resection depends on prevention of ischemic damage to the spinal cord during temporary aortic cross clamping. In patients with constrictive lesions, in whom there is no haste in restoration of aortic flow, emphasis is placed on precise reconstruction of all major vascular channels by homograft. In the authors' patient with acquired coarctation of the aorta, constrictions occurred in the lower thoracic aorta and in the proximal abdominal aorta. Good results were obtained after two homografts were inserted at an interval of four months; the first graft was inserted to replace the resected segment of the terminal thoracic aorta and the second to bridge the defect between the graft in the thoracic aorta proximally and the abdominal aorta distally. The first graft was in good condition at the time of the second intervention. Since this paper was submitted for publication, nine additional patients were subjected to resection of the thoracic aorta and replacement by homograft; five were operated on for aneurysms and four for constrictive lesions. All of these patients recovered.

Four Years' Clinical Experience with Internal Mammary Artery Implantation in the Treatment of Human Coronary Artery Insufficiency Including Additional Experimental Studies. A. Vineberg, D. D. Munro, H. Cohen and W. Buller. J. Thoracic Surg. **29**:1-36 (Jan.) 1955 [St. Louis].

Of 29 men between the ages of 36 and 60 years with coronary artery insufficiency who underwent the internal mammary artery implant operation, the first 10 were followed for from one to four years, and 19 were followed for from 2 to 11 months. Twenty-three of the 29 patients had no anginal pain at rest. One of these patients died, a mortality rate of 4.3%. Thus for patients without anginal pain at rest the mortality rate is low. Of the six patients who had anginal pain at rest, three died in the series followed for up to four years, a mortality rate of 50%. The mortality rate for the entire group of 29 patients was 14%. Of the 23 patients who had the operation completed and survived, 15 or 60% are now completely free of pain. Seventeen (73%) returned to work after the operation, and many are working 8 to 16 hours daily at hard physical labor. Experiments on dogs showed that the implanted internal mammary artery was sending out large branches in the ventricular myocardium in 15 (71%) of 21 animals. These branches were large enough to carry a supply of fresh blood into the heart at a rate as high as 51 cc. per minute. The pericardial fat pads were used as grafts applied to the surface of the left ventricle to supplement the internal mammary artery revascularization of the left ventricle. The results in the authors' patients are beginning to parallel very closely the frequency of mammary-coronary anastomosis demonstrated in their animal experiments.

Spontaneous Rupture of Esophagus. J. R. Boulle. Brit. M. J. **1**:25-26 (Jan. 1) 1955 [London, Eugland].

The occurrence of spontaneous rupture of the esophagus in an obese 73-year-old woman is reported. There was a sudden onset of severe upper abdominal pain, which rapidly spread to both sides of the lower chest and back. After 30 minutes the

patient vomited a little blood-stained fluid and then collapsed with pain. Roentgenograms of the chest were made, and three mouthfuls of barium mixture were given the patient to swallow before repeating the pictures. There was pronounced widening of the mediastinum, and much free gas was present in it. There was slight collapse of the medial lung substance at both bases and little free pleural effusion on each side, but no pneumothorax. Barium had passed into the posterior mediastinum to the left at the level of the lower part of the body of the seventh thoracic verteba. Through a right thoracotomy, the intact mediastinum was widely opened, releasing air under pressure and blood and pieces of meat partaken of four hours before the onset of the condition. The tear in the esophagus was not located, but the left side of the lower esophagus could not be seen satisfactorily by this approach. A wide-bore stomach tube was passed without revealing the tear. The chest was closed after inflating the right lung and two intercostal drainage tubes, leading from the mediastinum and the pleural cavity to underwater seals, were inserted. After 36 hours the patient's condition deteriorated, and she died 48 hours after the surgical intervention. Autopsy revealed that the esophagus had a vertical tear 2 in. (5 cm.) long on its left posterior aspect, the lowest part of the tear being 1.5 in. (3 cm.) from the esophagocardial junction. Microscopic examination of many sections of the esophagus about the tear showed no evidence of preexisting disease, and the appearances were consistent with spontaneous rupture. In this case the tear was typical, as were the symptoms. The pleural cavity was not directly involved, as it often is on the left side. No history of vomiting before the rupture could be obtained, though there was a long history of habitual voluntary vomiting for the relief of dyspepsia. The value of roentgenograms and the use of contrast mediums as a swallow, to establish or confirm the diagnosis, was affirmed.

Comparison of Vagotomy and Gastric Resection for Gastrojejunal Ulceration: Follow-Up Study of 301 Cases. W. Walters, D. P. Chance and J. Berkson. Surg., Gynec. & Obst. **100**:1-10 (Jan.) 1955 [Chicago].

The terms gastrojejunal ulcer, stomal ulcer, marginal ulcer, postoperative jejunal ulcer, and jejunal ulcer are used more or less synonymously to designate recurrent peptic ulceration following some type of gastrojejunal anastomosis. Between 1945 and 1952, inclusive, 617 operations were performed at the Mayo Clinic on 586 patients for gastrojejunal ulcer. This study is concerned with 301 of these patients, 143 having undergone vagotomy alone or combined with additional procedures, and 158 having undergone either gastric resection or a reresection, in the treatment of gastrojejunal ulcer. Gastrojejunal ulcers following gastroenterostomy differ from those following gastric resection both in certain clinical features and their surgical management. Gastrojejunal ulcers developed after gastric resection in 115 and after a previous gastroenterostomy in 186 patients. The interval between the previous and definitive operation for gastrojejunal ulcer was 3.7 years for those having previous gastric resection and 11.2 years for those having previous gastroenterostomy. Of the 115 patients with gastrojejunal ulcers after previous gastric resection, 88 were treated by vagotomy, 14 by vagotomy and gastric reresection, and 13 by gastric reresection. Of the 186 patients with gastrojejunal ulcers after gastroenterostomy, 29 were treated by vagotomy alone, 3 by vagotomy and gastric resection, 9 by vagotomy combined with other operations, and 145 by the taking down of the gastroenteric anastomosis, excision of the ulcer, and partial gastric resection. Gastrojejunal ulcers developing after gastric resection are best treated by vagotomy alone or combined with another procedure. Vagotomy alone produced excellent results in 55 of 78 patients so treated. Vagotomy and gastric reresection gave excellent results in all nine patients treated in this way, while gastric reresection alone gave excellent results in only four of seven patients. A gastrojejunal ulcer that follows previous gastroenterostomy is best treated by a taking down of the anastomosis, excision of the ulcer, and adequate gastric resection. This procedure gave excellent results in 96 of 111 traced patients with ulcers of this type who were so treated; and 21 of 27 patients with such ulcers had excellent results after vagotomy. Gastrointestinal hemorrhage recurred after vagotomy for gastrojejunal ulcer in 13 of 124 patients, whereas 111 had no further hemorrhage. Of the 118 patients followed who had gastric resection or reresection, only 4 had further hemorrhages, while 114 did not. Insulin tests were made after vagotomy on 71 patients; results were normal in 61 of the cases. Gastric analysis after vagotomy disclosed that 28% of the patients with gastrojejunal ulcers after a previous gastroenterostomy and 54% of those who had previous gastric resection were rendered achlorhydric by the operation. Of those treated by gastric resection or reresection, 81% of those with gastrojejunal ulcers after previous gastroenterostomy and 50% of those with ulcers after previous gastric resection were rendered achlorhydric by the operation.

Clinical and Experimental Evaluation of the Noble Procedure: Plication of the Small Intestine. J. D. Martin Jr. and W. C. McGarity. South. M. J. **47**:1180-1184 (Dec.) 1954 [Birmingham, Ala.].

Martin and McGarity point out that Noble recommended plication of the small intestine in 1937 as a prophylactic measure against the formation of adhesions, using it primarily in peritonitis. Later, the procedure was recommended by Noble and others for chronic intestinal obstruction from recurring adhesions, for the problem becomes increasingly great with each successive episode of partial or complete obstruction. Although Noble was very enthusiastic about the plication method, others demonstrated that it involves risks and pitfalls. The present authors feel that the method has never had a fair trial, because few employ it. They present the histories of three patients in whom they performed plication. In the first of these patients multiple bare areas of serosa were produced when postoperative adhesions were released, which had given rise to intestinal obstruction. The distal jejunum and proximal ileum were plicated with interrupted silk sutures. The subsequent course was uneventful. In the second patient multiple raw serosal areas in the distal jejunum and proximal ileum resulted from freeing an obstruction. This area was plicated, using approximately 8 in. (20 cm.) loops, sutured with interrupted black silk sutures placed midway between the mesenteric and the antimesenteric borders of the small intestine. In the postoperative period the patient complained of cramping pain in the lower abdomen. It was necessary to continue suction, intravenously given fluid therapy, and the administration of antibiotics for 17 days. Thereafter oral feedings were tolerated. Later a subphrenic abscess had to be drained. In the third patient multiple adhesions involving the lower half of the ileum were found. Enterolysis was carried out from the ligament of Treitz to the ileocecal valve. A series of 8-in. plications were made through this area. Several months later, signs of early obstruction developed, which however subsided under conservative management. Plications were made in ten dogs, and changes in electrolytes and in nutrition were studied. Reoperation or autopsy studies on these dogs revealed that the plications were not entirely satisfactory. This was due to the breakdown of the suture line, which left openings through which intestinal loops could be caught and also permitted the formation of new adhesions. The authors feel that some patients may be benefited by the Noble plication procedure, but the indiscriminate use of the method should be avoided.

Unusual Complications of Intestinal Intubation. E. J. Drouillard, W. B. Cox and H. M. Blegen. Rocky Mountain M. J. **51**:1063 (Dec.) 1954 [Denver].

Drouillard and associates present the case of a 72-year-old man in whom roentgenograms of the abdomen revealed volvulus of the sigmoid colon. In preparation for surgery, a Honor-Smathers-Long tube was inserted through the nares, but due to gagging, the mercury-filled balloon was brought into the patient's mouth, and he ruptured the bag with his teeth and aspirated the mercury. Postural drainage succeeded in removing much of the mercury from the bronchi during the postoperative period. The patient showed no signs or symptoms due to the presence of metallic mercury within the bronchi.

Three months later, roentgen examination of the chest revealed considerable decrease in amount of mercury within the bronchi. Again the history and physical examination failed to reveal any untoward result due to the aspirated mercury. Apparently mercury has no effect on the body if surrounded by intact epithelium.

Resection for Pulmonary Tuberculosis: A Comparative Study of Segmental Resections and Lobectomies. A. H. S. Raymond Jr. and F. H. Cole. Ann. Surg. **141**:87-90 (Jan.) 1955 [Philadelphia].

Of 150 pulmonary resections performed on 147 patients with pulmonary tuberculosis, 100 lobectomy resections were done on 99 patients and 50 segmental resections were done on 48 patients. There were no deaths among the patients with segmental resections. Two of the patients who underwent lobectomies died within 90 days of the operation, and a third patient died later from causes unrelated to surgical intervention, i. e., a mortality rate of 3%. Only one of the three patients died of causes directly related to his disease; thus the corrected mortality rate for lobectomies would be 0.66%. These results compare favorably with those reported by other authors; the progressive drop in mortality seems to be directly related to the better chemotherapeutic drugs now available, to improved surgical techniques, and to better methods of anesthesia. Postoperative follow-up varied from 8 to 27 months. Forty (83.3%) of the 48 patients with segmental resections were well with negative sputums and no active disease, while 73 (73.7%) of the 99 patients with lobectomies were well. Seven patients (7%) are still under treatment for pulmonary disease after lobectomy, as compared to three (6.3%) of those with segmental resections. The complication rate for both the segmental resections and lobectomies was about the same. Both segmental resection and lobectomy can be considered quite satisfactory in carefully selected patients. The choice of procedure is made at the operating table after a complete examination of the lung, correlated with the information available from preoperative observation and study.

The Life History of Patients With Cirrhosis of the Liver and Bleeding Esophageal Varices. M. M. Nachlas, J. E. O'Neil and A. J. A. Campbell. Ann. Surg. **141**:10-23 (Jan.) 1955 [Philadelphia].

The life history was studied of 112 patients with cirrhosis of the liver who were admitted to the Boston City Hospital between 1944 and 1954 and who had bled on 176 occasions. Ten of the 112 patients were operated on after their initial hemorrhage had ceased, and they were included in the authors' study only as patients who had survived hemorrhage. The study of the remaining 102 patients who did not receive surgical therapy but were exposed to most of the advantages of modern medical management, including blood transfusions, modern dietary regimens for liver disease, antibiotics, and esophageal balloon tamponade, was carried out in the belief that it is essential to know what will happen to patients with cirrhosis of the liver and bleeding esophageal varices who are not operated on, in order to assess accurately the value of any surgical procedure for this condition. Sixty of the 102 patients died within a month of their first hemorrhage. Of these, 19 died in hepatic coma after a mild or significant hemorrhage, while 41 had a severe hemorrhage. Forty-two of the 102 patients survived their initial hemorrhage and only one-third of these died during the subsequent year. Eighty-eight of the 102 patients died during the period of the authors' study, and in 84 of these a hemorrhage was the precipitating or causative factor. In 62 patients the source of the bleeding was determined to be their esophageal varices by either roentgenogram, esophagoscopy, control by esophageal balloon tamponade, or postmortem confirmation. Recognizing the possibility of some slight error, the following statements appear to be well founded: 1. The patient with proved cirrhosis of the liver who has a significant upper gastrointestinal hemorrhage can be said to be bleeding from esophageal varices when the other more common lesions of the stomach and duodenum are ruled out. With careful and repeated examinations, the varices should be demonstrated in many cases. 2. Hypoprothrombinemia and hypersplenism probably play a minor role in most of the bleeding patients. 3. While the first hemorrhage takes the lives of 60% of the patients, one who survives this episode has two out of three chances of being alive at the end of one year. 4. At the time of death, the differences in the clinical and laboratory signs of hepatic decompensation between those dying of exsanguination and those dying in hepatic coma are not striking. 5. In contrast to this finding, pronounced differences were noted in the signs of liver reserve in the patients surviving a hemorrhage as compared to those dying. 6. The severity of the hemorrhage and the evidence of hepatic compensation are the important features in estimating the prognosis of the cirrhotic patient with a ruptured esophageal varix. 7. A thorough analysis of the patients treated surgically, a one-year follow-up study, and a careful comparison with the control series should demonstrate the value of the surgical procedure employed.

NEUROLOGY & PSYCHIATRY

Neurological and Mental Complications of Rubella. W. Mitchell and G. Pampiglione. Lancet **2**:1250-1253 (Dec. 18) 1954 [London, England].

Mitchell and Pampiglione report the case of a man, aged 45, who had been in excellent health. His two children developed rubella (German measles) with typical rash and cervical lymphadenopathy. One of them had mild pyrexia and malaise lasting a few days. Four days after the rash appeared in this child, the father developed a rash and cervical lymphadenopathy. He retired to bed two days later rather drowsy and irritable. On the fourth day his temperature was 101 F. He became semicomatose, with retention of urine, and was admitted to hospital. The detailed report of the further course shows that the rubella severely affected the patient's brain stem and spinal cord and probably his frontal lobes, causing gross mental disturbance that lasted two months in severe form and gradually cleared up in six months. Except in toxic or metabolic psychoses it is uncommon for complete recovery to follow such a widespread lesion of the central nervous system. Such recovery supports the view that the anatomic changes supposed to be related to the neurological complications of rubella are largely reversible in weeks or months. The present case is of interest because of the unusual severity of the mental disturbances not previously described as a complication of rubella, and the electroencephalographic studies, which appear to be the first reported in rubella. The authors point out that although most textbooks describe rubella as a mild disease of short duration, which rarely results in severe complications, in the last 30 years there have been several descriptions of fairly serious involvement of the central nervous system following or accompanying an otherwise normal rubella. The onset of central nervous system complications is usually three or four days after the appearance of the rash. The patient then complains of headache, apathy, and a stiff neck, and less often of nausea and vomiting. Coma often follows in a few hours and may persist from a few hours to three days. If the patient does not die at this stage he can be expected to recover gradually in a few weeks. In some cases the central nervous complications have preceded the rash, and in one case the rash recurred after the onset of neurological complications. In the cerebrospinal fluid a slight increase in protein and a large increase in the number of cells (mainly lymphocytes) are usually found. Postmortem examination usually shows no demyelination in these cases, in contrast with the extensive demyelination often found with other exanthems, particularly measles. This finding may suggest that few if any irreversible changes take place in neurological complications of rubella. It also may explain that, if the patient does not die in the first week, he recovers either completely or nearly so.

Observations on the Motor System Following Cerebral Hemispherectomy. L. A. French and D. R. Johnson. Neurology **5**:11-14 (Jan.) 1955 [Minneapolis].

An attempt was made to alleviate intractable convulsive seizures in eight patients who had seizures associated with a spastic hemiparesis or hemiplegia, that is, motor function was not normal preoperatively. All patients had become hemi-

paretic many years previously, most of them in early life. That this influences the final results of hemispherectomy cannot be disregarded. The effect of unilateral cerebral hemispherectomy on the motor function of patients with infantile hemiplegia is considerably different from that expected to follow such a radical procedure. When the area of the brain that is presumed to affect motor control of the body is destroyed in adults, a severe lasting hemiplegia occurs. In such patients there is no recovery of function in the arm and little if any return of useful function in the leg. With similar lesions in patients who suffer hemiplegia in infancy or early childhood, comparable motor deficits do not occur. Seven of the eight patients in this series had become hemiplegic in infancy or early childhood and, although they were able to walk, all had some spastic deformity of the involved side. At first, only severe cases of hemiplegia were chosen, to avoid causing further motor deficit. This initial fear was unfounded; in the last few patients of this series the degree of preoperative hemiparesis has been relatively minimal. In these latter cases the postoperative neurological status was good enough to permit the patients to do almost anything other children of their age could do. The effect of removal of the entire cerebral cortex as well as most of the basal ganglions did not result in any exaggeration of motor deficit even though the preoperative motor deficit was fairly minimal. The caudate nucleus does not seem to be necessary for the integrity of the motor function of the contralateral extremities. Immediately after operation the involved extremities are flaccid, but over a period of many months they again become spastic, comparable to their preoperative status. Abdominal reflexes are not abolished by hemispherectomy. It is believed that the rapid return of motor function to the preoperative level is due to the contralateral hemisphere having assumed the function of the abnormal side many years preoperatively. It is felt that the abnormal hemisphere offers only a restraining effect on the motor function of the normal side.

Landry-Guillain-Barré Syndrome: Cardiovascular Complications: Treatment with ACTH and Cortisone. E. Clarke, R. I. S. Bayliss and R. Cooper. Brit. M. J. **2**:1504-1507 (Dec. 25) 1954 [London, England].

The occurrence of acute circulatory failure as a complication of the Landry-Guillain-Barré syndrome is reported in a 63-year-old woman and in two men, aged 45 and 30 years respectively. The predominant feature of the circulatory collapse was hypotension. In the younger man, whose illness in its early phase was typical of the Landry-Guillain-Barré syndrome, the circulatory failure was associated with a recrudescence of muscular weakness and the development of a pericardial friction rub. This suggests that the relapse was due to a reactivation of the disease process that involved the pericardium and also the myocardium, since the circulatory failure and hypotension are not usual features of acute pericarditis. Although respiratory failure also occurred at this time, there was no biochemical evidence of carbon dioxide retention or depletion, and no circulatory disturbance had occurred when the respiratory insufficiency was equally severe in the earlier phases of the illness. The patient was given 300 mg. of cortisone by mouth during the first 24 hours after he began to show signs of circulatory failure, and thereafter he was given 50 mg. daily. An intravenous infusion of plasma containing 80 mg. of arterenol (nor-epinephrine) per 500 cc. was started, and the rate was adjusted to maintain a blood pressure of 120/80 mm. Hg. After 13 hours the infusion was discontinued, after which there was a transient fall in blood pressure, with tachycardia lasting about two hours. Recovery then began to take place with slow improvement during the next four months. The case of the 45-year-old man was one of the slowly progressive type of the Landry-Guillain-Barré syndrome. The muscle weakness was not maximal until the eighth week of the disease, and it was at this time that the acute circulatory failure occurred that was unassociated with any respiratory muscle failure. The onset of the circulatory disturbance was heralded by an attack of nocturnal dyspnea, presumably due to left ventricular failure, and followed by severe hypotension and impalpable peripheral pulses. Although there was a nodal tachycardia (110 beats per minute), this was neither sufficiently rapid nor sufficiently prolonged to be the cause of the heart failure. The patient was given 1 mg. of digoxin intravenously, followed by 0.5 mg. every six hours by mouth, and was also given 75 mg. of cortisone every six hours by mouth. Within seven hours the patient's cardiovascular condition improved greatly, and it is reasonable to believe that a large part of this response was attributable to the effect of cortisone. Recovery of muscular power also began to occur after the administration of cortisone in the two men. The woman, who was older than the two men, presented a difficult therapeutic problem, because even before respiratory paralysis developed she had hypertension and her pulmonary function was limited by obesity and chronic bronchitis. The onset of circulatory failure coincided with maximum involvement of the nervous system; circulatory failure occurred after 17 hours of respiratory difficulty and resulted in death. The autopsy findings were not helpful in elucidating the mechanisms involved. When the clinical picture of Landry-Guillain-Barré syndrome is complicated by circulatory collapse, it is suggested that involvement of the myocardium rather than loss of peripheral vascular tone may be the cause. For this reason an infusion of arterenol should be given to combat the hypotension, together with digoxin and cortisone in divided oral doses of 300 mg. during the first day, 200 mg. during the second day, and 100 mg. daily thereafter, in the belief that these may improve the myocardial function and perhaps favorably influence the pathological process.

GYNECOLOGY & OBSTETRICS

The Value of Centesis as Diagnostic Procedure in Ruptured Ectopic Gestation. M. L. Bobrow and L. B. Winkelstein. Am. J. Obst. & Gynec. **69**:101-109 (Jan.) 1955 [St. Louis].

The increasing frequency of extrauterine gestation is regarded by many as one of the end-results of antibiotic therapy in acute and chronic salpingitis. It has been postulated that the fallopian tubes, although irreversibly damaged by infection, retain partial patency. Either because of abnormal motility, narrowing of the lumen, or the formation of a pseudofollicular salpingitis, however, the zygote cannot reach the uterine cavity, resulting in the formation of a growing extrauterine pregnancy. Tubal gestation presents only the signs and symptoms of early intrauterine pregnancy and cannot easily be diagnosed until that time in its development when rupture of the tube, erosion of a blood vessel, or extrusion of the fetus occurs. The authors review cases in which ectopic pregnancy was the preoperative diagnosis, or in which such a diagnosis was made on exploratory laparotomy. The group studied covers a period of five years and includes 431 operative procedures. In 373 of the 431 laparotomies extrauterine pregnancies were found. It was felt that because of the variable pictures presented by extrauterine pregnancy and because of the need of a rapid and essentially correct diagnostic procedure, aspiration of the cul-de-sac and paracentesis might be of value. A total of 193 such punctures were made, 160 in cases later proved by surgery to be ruptured extrauterine pregnancies, and 33 where no such abnormality was found. Cul-de-sac puncture alone was correct in 80% of the cases tested. When paracentesis was used as an adjunctive procedure following cul-de-sac aspiration with normal results, the average of correct diagnoses of abnormal condition was about 85%. In 58 cases where no ectopic gestation was found on operation, cul-de-sac aspiration gave 91% correct results. Despite these apparently good averages, false diagnoses of abnormal condition (9%) and false indication of normal condition (20%) were obtained. In 75% of all cases, however, the correct diagnosis had been reached without the primary support of taps and on the basis of the history and physical examination alone. In the remaining 25% (40 cases) diagnosis was most difficult because of equivocal history and physical findings. It was felt that in this group the value of centesis might be demonstrated. In a critical study of the cases, however, it was found that cul-de-sac aspiration was correct in only 55% of the cases studied. When followed by paracentesis, the correct average was 65%. Despite the fact that the procedure of centesis is not a totally accurate one, the authors felt that, because of ease of performance and rapidity of results, it has a definite value

for verification of the diagnosis of ruptured tubal gestation and tubal abortion. It cannot, however, replace good clinical judgment, nor can it produce a correct result when the amount of bleeding into the peritoneal cavity is minimal or localized. Centesis, both through the cul-de-sac and through the abdominal wall, when properly performed, is felt to be a procedure that may be considered a help in diagnosis of suspected tubal abortion or ruptured tubal gestation.

A Short Term Treatment for Trichomonas, Monilial, and Nonspecific Vaginitis: Preliminary Report of Results with Gyneben. W. H. Tinsley. Texas J. Med. **51**:5-7 (Jan.) 1955 [Austin, Texas].

Tinsley describes experience with the use of the vaginal suppository, Gyneben, which contains: diiodohydroxyquinoline, sulfadiazine, diethylstilbestrol, sodium lauryl sulfate, tartaric acid, boric acid, dextrose, lactose, and lanolin. When this preparation was used, the patient was advised to insert one suppository high into the posterior fornix of the vagina early each morning and each night upon retiring. In the morning, before insertion, a mild acid douche of 2 qt. (946 cc.) of warm water with 4 tablespoons (60 cc.) of white household vinegar was to be used. In the teaching institution in which the described observations were made, new preparations were screened for their effectiveness. After satisfactory results had been obtained with Gyneben in 12 cases, it was compared with three other preparations. During this comparative study 20 patients were treated with Gyneben, so that the praparation has been used in a total of 32 cases, including patients with Trichomonas vaginalis vaginitis, nonspecific bacterial vaginitis, and monilial vaginitis. Before treatment was begun, a definite diagnosis was established either by examining discharges in saline suspension or occasionally by culture for monilia. Patients were treated with Gyneben suppositories for 12 or 7 days. No signs or symptoms of sensitivity or toxic reaction to this medication were fund. Most patients interviewed remarked on the ease and shortness of treatment in comparison to other therapies used in the past. Patients usually were completely free of symptoms after two or three days of the regimen. Although the discharges were reexamined in suspensions once or several times after treatment, the author is not convinced that the vaginal infection or infestation has been completely eradicated. However, all the patients were completely free from symptoms, the greatest lapse of time between treatment and examination being six weeks. The author concludes that relief of symptoms will be obtainable in the commoner types of vaginitis with a maximum of 12 days of therapy consisting of one Gyneben suppository inserted into the vagina twice each day and that, in the most frequently seen types of vaginitis, a seven day course of therapy with the use of the vaginal insert night and morning will be sufficient.

Adrenalectomy for Breast Cancer. S. Cade. Brit. M. J. **1**:1-5 (Jan. 1) 1955 [London, England].

Of 69 bilateral adrenalectomies performed on women with cancer of the breast, 56 were done in patients with advanced and disseminated disease that was no longer amenable to treatment by surgical, radiological, or hormonal means. In every patient, skeletal, visceral, or soft-tissue metastases were widespread and the expectation of life was very limited. The preoperative preparation consisted of blood transfusions and the intramuscular administration of cortisone acetate in 100 mg. doses 48, 24, and one hour before the operation. Arterenol (nor-epinephrine) was used only as an emergency measure during the operation and in the immediate postoperative period. On the first postoperative day cortisone was given by injection in doses of 100 mg. every six hours; this dose was reduced to 50 mg. on the second postoperative day; from the third to the fifth postoperative day 25 mg. of cortisone acetate was given orally every six hours; this was further reduced to 75 mg. per day and finally to 50 mg. daily as a maintenance dose. Bilateral oophorectomy and unilateral adrenalectomy was done in one stage, and the second adrenalectomy was performed after an interval of seven days. Of the 56 patients, 8 died after the operation, a mortality rate of 13.6%. Death resulted from pulmonary embolus in one patient, from cardiac arrest in the course of the surgical intervention in one, from renal failure in two on the sixth and 21st postoperative days, from cerebral metastasis in one, and from pleural and pericardial involvement by the disease in three. Of the 48 surviving patients, 13 obtained excellent subjective results in the sense that bedridden patients with severe pain became ambulatory and no longer required analgesics. In 10 of these patients objective improvement was assessed by healing of fractures, alteration of osteolytic lesions to a normal bone structure, shrinkage of visible and palpable external tumors, and disappearance of metastases in the omentum, peritoneum, lungs, liver, and in the choroid. Extended survival with cortisone maintenance therapy has been obtained so far up to 24 months. Seven illustrative cases in women between the ages of 35 and 53 years are reported in detail. Satisfactory results were obtained in 17 patients; it was too early for assessment in 6; 12 derived no benefit at all from the operation, the disease progressed and most of them died within a few months. There is no method, so far, to forecast if a patient will be benefited by the operation or not. Beneficial effects were achieved in about 60% of the patients, and in 23% of all cases both subjective and objective improvement was achieved, which had never been accomplished before by any other method of treatment. The risk of the operation is reasonable and maintenance of life on cortisone simple. Although there is no likelihood of any permanent effect, the results are encouraging, and it seems justifiable to advise the operation at an earlier stage of the disease.

Carcinoma of the Cervix Uteri Treated at the American Oncologic Hospital, 1929 to 1949. G. A. Hahn. Am J. Obst. & Gynec. **69**:48-58 (Jan.) 1955 [St. Louis].

The American Oncologic Hospital is a 55 bed institution that deals primarily with patients who have neoplastic disease or who are suspected of having malignant disease. The majority of the patients are sent by physicians or other hospitals when a diagnosis of carcinoma is made or is suspected. The present report considers all patients seen at the American Ancologic Hospital with a histologically proved diagnosis of carcinoma of the cervix uteri during the 20 year period 1929-1949. During this time 319 patients were examined with a view to treatment. Patients with carcinoma in situ are not included in this report. Cervical cancer was most frequent in the age period 41-50, more than one-third of the patients (100) falling in this age group. Nearly one-third of the patients (94) were 40 years of age or less. Eighty-five per cent of the patients were parous. Abnormal vaginal bleeding was by far the most prominent symptom; 136 of the patients asked medical advice for this symptom. Other forms of vaginal discharge, dark yellow or brown in color, brought 40 patients to the physician. In 13 patients the chief complaint was pain. Only one patient was free from pelvic symptoms. A positive Wassermann test was observed in 13 patients (4.5%). A disproportionately high percentage of patients with carcinoma of the cervix and carcinoma of the tongue have syphilis, although this is not true of any other major form of cancer. Sixty patients had had previous operations for pelvic symptoms; 28 of them had undergone supravaginal hysterectomies. A plea is made for the more frequent use of a diagnostic curettage and circular cervical biopsy whenever pelvic surgery is done. During the period from 1929 to 1934, the patients were usually given two radium treatments with an interval of six weeks, and the second radium treatment was followed by a course of deep roentgen therapy. During the period 1934-1939 the same general plan was followed, but there was a tendency to increase the amount of irradiation. In the years 1939-1944 the same general plan was followed, although there was some tendency toward an increased amount of x-irradiation. From 1934 to about 1940 a 4 gm. radium bomb was utilized, when it was felt that the patient had received the utmost in roentgen therapy that was practical. The amount of radium in the bomb was reduced to 1.5 gm. in about 1940 and subsequently it was used less and less. From 1944 to 1949 there was a gradual increase in the amount of external irradiation given. There was a 26.3% five year survival rate in the 288 patients treated between 1929 and 1949. Twenty-eight of the 288 patients had carcinoma of the cervical stump. Six of these 28 patients survived five years or more. Complete abdominal hysterectomy is in general a far wiser procedure to carry out,

There were 10 patients who developed serious complications in association with their radiation treatment. Thirty-three patients required surgical treatment after their treatment at the Oncologic Hospital, mostly for radiation complications, obstructions, and intractable pain. Generalized metastases were listed most commonly as the ultimate cause of death. One patient had extensive metastases to the right side of the face and neck, another died with esophageal obstruction from metastatic spread, and another had the signs and symptoms of coronary disease due to metastases from carcinoma of the cervix uteri.

Radical Hysterectomy and Pelvic Lymphadenectomy: Review of 473 Cases Including 244 for Primary Invasive Carcinoma of the Cervix. W. Liu and J. V. Meigs. Am. J. Obst. & Gynec. **69:**1-32 (Jan.) 1955 [St. Louis].

This report is based on 473 cases of radical hysterectomy with pelvic lymphadenectomy performed by the staffs of four Massachusetts hospitals during a period of almost 15 years, ending in December, 1953. The operative procedure was that described by Meigs. In cases of carcinoma of the cervical stump or carcinoma of the vagina after a previous hysterectomy, the procedure was similar, with the radical removal of the broad ligament, paracervical and paravaginal tissue, and pelvic lymph nodes. The material is presented in two parts: (1) general information on patients who had radical hysterectomy with pelvic lymphadenectomy, and (2) the patients having carcinoma of the cervix who were treated with radical hysterectomy. The entire series of 473 cases included 294 cases of primary squamous cell carcinoma of the cervix, 27 primary adenocarcinoma of the cervix, one case of leiomyosarcoma of the cervix, 23 cases of carcinoma of the cervical stump, 47 primary carcinoma of the corpus, 5 primary carcinoma of the vagina, 21 recurrent or residual carcinoma of the uterus (18 were squamous cell carcinoma of the cervix and 3 were adenocarcinoma of the corpus), 34 carcinoma in situ of the cervix, and 21 referred cases in which cancer was found in the preliminary biopsy but there was no malignant disease in the surgical specimen. Surgical complications occurred in 24% of the patients, and the operative mortality was 1.7%. Fistula formation as an operative complication occurred in 45 patients (9% incidence); 35 of these fistulas involved the ureter. Thirteen of the 28 uncomplicated ureterovaginal fistulas healed spontaneously between 1 and 10 months. Of these 13 cases, 3 had functional preservation of the involved kidney (one after repeated ureteral dilatations, one after reimplantation of ureter into the bladder, and one had no surgical intervention). The value of radical hysterectomy with pelvic lymphadenectomy for carcinoma of the corpus is yet to be determined. The present series is regarded as an experiment that takes on added interest from the finding that there was lymph node metastasis in 11 of the 47 cases. There were 344 cases of primary invasive carcinoma of the cervix. The number included 231 stage 1, 109 stage 2, and 4 stage 3 cases. The incidence of lymph node metastasis in the entire group of 344 was 26%; it was 28% in the 85 who received preoperative irradiation and 25% in the 259 who received no preoperative irradiation. One hundred ninety-three patients with carcinoma of the cervix were operated on and followed for five or more years. Stage 1 cases numbered 139, stage 2 cases 53, and only one case was in stage 3. The five year salvage rate in the 139 stage 1 cases was 75% and in the 53 stage 2 cases 54%. Radical hysterectomy with pelvic lymphadenectomy salvaged 17 of 49 (about a third) of those who had lymph node metastasis and 116 of 144 (over 80%) of those who had no lymph node metastasis.

Syndrome of Ovarian Agenesis: Its Essential Characteristics and Its Inconstant Anomalies. B. Courvoisier and E. Martin. Schweiz. med. Wchnschr. **84:**1436-1437 (Dec. 25) 1954 (In French) [Basel, Switzerland].

Two extreme instances of congenitally aplastic or completely absent ovaries are described in a 21-year-old woman and in a 50-year-old woman respectively. Both patients showed sexual infantilism, scanty pubic and axillary hair, infantile breasts, and broad deep chest, which are characteristics of the syndrome. The young woman had in addition multiple congenital malformations such as nanism, an undersized, webbed neck, and ocular abnormalities. All these associated dystrophies were absent in the 50-year-old woman who showed the late skeletal sequels of ovarian agenesis, such as a relative macrocelia (waist 60¼ in. [153 cm.] and full span of arms 64 in. [163 cm.]) and diffuse osteoporosis. The multiplicity and diversity of the congenital dystrophies observed in ovarian agenesis confer on the syndrome a more and more polymorphous character. Of the authors' two patients, one had various congenital deformities including those described by Turner, while the other had the essentially secondary disturbances associated with congenitally aplastic ovaries. Only the constitutionally abnormal thorax was observed in both patients and in all cases collected from the literature, and thus it seems to be pathognomonic. It appears appropriate to differentiate the early symptoms of ovarian agenesis (sexual infantilism revealed at the age of puberty) from the more delayed sequels. The skeletal disproportion resulting from the retarded maturation of bones, as well as the osteoporosis, are the most conspicuous manifestations of a hormonal deficiency that continues beyond puberty.

Cortisone and Adrenalectomy in Treatment of Sterility in Women with Adrenogenital Syndrome. S. F. Wilhelm and R. G. Marks. J. Urol. **73:**17-24 (Jan.) 1955 [Baltimore].

Inability to conceive was the chief complaint of three married, hirsute women, aged 28, 28, and 29 years, respectively, with adrenogenital syndrome. A partial unilateral adrenalectomy was performed in the first patient, who became pregnant two months after the surgical intervention and gave birth on term to a normal boy. Excision of an adrenal adenoma was performed in the second patient and was followed by an uneventful pregnancy four months after the surgical intervention; a normal boy was born. The third patient, who had been unable to conceive in almost nine years of marriage, was treated with cortisone; 25 mg. was given orally per day for two weeks; the daily dose then was increased to 50 mg. and treatment was continued for seven weeks. The formerly elevated urinary 17-ketosteroid excretion was soon reduced to normal levels. The dose of the drug then was reduced to 25 mg. daily, and treatment was continued for additional three weeks. Because of the patient's failure to lose weight, the daily dose was increased to 37.5 mg. Treatment with this dose had been continued for four weeks when examination by the patient's obstetrician revealed that she was 10 weeks pregnant. Impregnation occurred shortly after excretion of 17-ketosteroids had become normal. Temporary cessation of cortisone therapy for one week caused a rise in urinary excretion of 17-ketosteroids. Treatment with cortisone in doses of 50 mg. daily was resumed, and it was continued with doses of 25 mg., 12.5 mg., and 37.5 mg. daily for four and a half months, until the patient gave birth to an apparently normal premature female baby, who died three days later. Autopsy did not reveal that cortisone had any deleterious effect on the baby; the finding of intracranial and adrenal hemorrhage of varying extent seemed to be related to the infant's premature state. Results obtained in the authors' three patients and those reported by other workers indicate that sterility in women caused by androgenic adrenal cortical hyperfunction may at times be reversible. The cases caused by neoplasm require surgical excision. On the other hand, those due to hyperplasia or hyperfunction may properly be treated with cortisone.

UROLOGY

Chemotherapy in Renal Tuberculosis. R. M. Ford. M. J. Australia **2:**808-811 (Nov. 20) 1954 [Sydney, Australia].

Ford reviews observations on 10 patients with genitourinary tuberculosis who were treated with chemotherapy. They included two who received surgical treatment plus chemotherapy, five who received chemotherapy for postoperative extension of disease, and three who were treated for bilateral disease. The treatment was usually as follows. A strict sanatorium regimen was instituted; streptomycin plus isoniazid formed the basis of chemotherapy, *p*-aminosalicylic acid replacing the former when the course was completed. The average duration of treatment

was 12 months. The dosages were as follows: streptomycin, 2 grains (130 mg.) three times a week for six months (1 gm. twice a day was used as a purely operative "cover"). Isoniazid was given in daily doses of 400 mg. and *p*-aminosalicylic acid in daily doses of 12 gm. The condition of all patients was assessed clinically, bacteriologically, cystoscopically, and by intravenous and retrograde pyelography prior to treatment and at intervals of three months thereafter. It was found in this series that isoniazid, used with streptomycin, is a most effective chemotherapy; that, whenever possible, a preoperative course of these drugs should be given for two to three months in order to render operation safer; and that far-advanced disease responds very well, especially clinically, to this regimen of treatment given over a minimum period of 12 months. A plea is made for close cooperation between surgeons and tuberculosis physicians in the assessment of treatment and in the management of all patients with genitourinary tuberculosis.

Experiences with Suprapubic Catheterization. V. Lane. J. Irish M. A. **36**:18-19 (Jan.) 1955 [Dublin, Ireland].

Suprapubic catheterization was begun at two Dublin hospitals in 1949. Since then the method has been used in the treatment of retention of urine due to prostatic disease in more than 350 cases. An introducer has been used since October, 1951. The size of its cannula is 24 F., and catheters from 20 to 16 F. can be introduced. It is important to have the cannula appreciably larger than the catheter, because this lessens the inflammation along the track. Introduction is simple. With the patient under local anesthesia a small incision is made in the skin three or four fingerbreadths above the pubis and an inch to one side of the midline. It is important to incise also the rectus sheath. A lumbar puncture needle is inserted downward and backward, and, if urine is withdrawn, the introducer is then inserted in the same direction. The catheter is pushed well into the bladder and sewn to the skin. Before carrying out suprapubic catheterization, it is essential that the bladder is adequately distended. If this is not the case, which is likely if catheterization has been done in the patient before arrival, he should be encouraged to drink water. Nearly every bladder can be sufficiently filled. In very fat patients it is difficult to be sure of the level of the bladder, and the technique is more difficult; also the catheter may come out or infection may develop. For these reasons, suprapubic catheterization has been abandoned in very fat subjects. Another contraindication to the method is a history of hematuria. Occasionally the approach to the bladder or retropubic space is made difficult by adhesions. The author uses the method not only for prostatic obstruction but also for several other conditions causing retention of urine, for lesions of the spinal cord; urethral strictures with perineal inflammation where urinary diversion is required; some cases of trauma to the urethra; and other miscellaneous conditions. The ultimate place of suprapubic catheterization in the treatment of acute retention in a patient who should be fit for operation in a few days is difficult to assess. The author makes extensive use of this method in a hospital with 70 beds for urologic patients and only one operating theater, in which there is frequently some delay before prostatectomy. He advocates the method for the patient who will not be medically fit for operation for some time and in those with chronic retention, who must have preoperative drainage. It spares the urethra, avoids the danger of epididymitis, is infinitely more comfortable for the patient, and makes preoperative cystoscopy more accurate and transurethral resection easier. Therefore, suprapubic catheterization deserves wider use. There has been no fatality and only two serious intraperitoneal complications. Incorrect changing is the chief cause of complications.

The Sexual Function in Paraplegia. H. S. Talbot. J. Urol. **73**:91-100 (Jan.) 1955 [Baltimore].

A study of the sexual function, and particularly of the neuromuscular phase of sexual activity, was carried out in 408 paraplegic and quadriplegic young men with levels of neural involvement varying between the fifth cervical segment and the cauda equina. In most of the patients the cord lesion was of traumatic origin. Two hundred patients were treated at the McGuire Veterans Administration Hospital in Richmond, Va., and 208 at Cushing Veterans Administration Hospital in Framingham, Mass. In both groups, about 75% were still in the hospital when studied, the remainder having been discharged to their homes. Many of those still hospitalized had been out of the hospital on leaves and thus had an opportunity to put their abilities to test. The data were gathered by individual questionnaires, answered under a pledge of anonymity. The erectile function had not survived in 138 (34%); erections were produced only on a reflex basis by local stimulation in 186 (45.5%), and 84 (20.5%) responded to psychic stimulation as well. Return of this function had usually occurred within six months after injury. Of the patients who had erections, about one-third had had intercourse, and more than half of these reported a sense of gratification. Since most of these men were still hospitalized while the investigations were being carried out, these figures are probably conservative. It would appear that about 5% of these men are fertile. The psychic aspect of sexuality usually remains unimpaired. The endocrine factor of gonadal function is likewise unchanged, and there are, therefore, no modifications of secondary sexual characteristics. Alterations in the germinal epithelium and varying degrees of spermatogenic arrest are common. Although this may be the direct result of the neurogenic factor, it is more likely to be a consequence of a deteriorated general condition or hormonal imbalance. Considering the sexual manifestations as a whole, it is apparent that the popular belief that all of these men are totally inadequate is unjustified. In view of the survival of a number of the components that go to make up the total sexual function, it is possible, by careful study and treatment of the individual patient, to develop a reasonably satisfactory type of sexual activity. This has already been done in a number of cases and should be done in a great many more. Its importance to the patient's rehabilitation and well-being requires no emphasis.

PHYSIOLOGY

Nutritive Value of the Diets of Iowa School Children. E. S. Eppright, V. D. Sidwell and P. P. Swanson. J. Nutrition **54**:371-388 (Nov.) 1954 [Philadelphia].

Information from studies of diets, nutritional status, and metabolism has been pooled to form a basis for the Recommended Allowances of the National Research Council, proposed for children of specific age-sex groupings. In view of the lack of information concerning changes in the nutrient needs during childhood, mean daily intakes of food energy and 10 nutrients were estimated by Eppright and associates from seven-day dietary records for Iowa school children at successive ages from 6 through 18 years. Except for calcium, boys tended to have larger mean intakes of food energy and nutrients at successive years. The intakes of girls 6 to 12 years of age tended to increase irregularly, but beyond 12 food energy and nutrient consumption remained the same or decreased, except for ascorbic acid. At 12 years trends in nutrient intake of girls changed markedly, and at 16 negative deviations from the allowances were especially noticeable. The mean daily nutritive value of the diets of boys at most ages and of girls 6 through 12 years of age approximated or exceeded the Recommended Allowances, except in calcium. After 12, girls tended to have diets below the allowances in most nutrients, but the deviations were greatest in iron and calcium. In each age-sex group about 12, 42, and 46% of the total food-energy value of the diet was obtained from protein, fat, and carbohydrate, respectively. Mean daily protein intake during school age decreased from 2.7 to 1.1 gm. per kilogram of body weight for girls and from 2.9 to 1.5 for boys. Mean daily intakes of thiamine, riboflavin, and niacin were related to mean daily intake of protein. These observations of trends in nutrient consumption directed attention particularly to the disparity between the apparent calcium intake of Iowa school children and their estimated needs. Further study of the actual intakes and needs of girls in consecutive years, especially during the teen-age period, is also indicated.

BOOK REVIEWS

Diagnosis and Treatment of the Acute Phase of Poliomyelitis and Its Complications. Edited by Albert G. Bower, M.D. Cloth. $6.50. Pp. 257, with 64 illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1954.

This book, written by 13 contributors, deals principally, and in adequate detail, with their experiences at Los Angeles County Hospital in the care of respiratory insufficiency in patients with poliomyelitis. It stresses the life-saving diagnostic and therapeutic measures used. It covers the role played by the various specialties. The indications for tracheotomy are well explained. The chapter on detection and care of respiratory difficulty is very well done. The principles advocated apply to other conditions contributing to respiratory distress. The experiences of the group with mechanical apparatus, as well as the equipment itself, is clearly described. The biological and electrolytic changes that occur in the disease are taken up in adequate detail. The experiences of a small county medical society in planning the care of severe poliomyelitis is enlightening. Only a few references are given. This book is a valuable guide for the care of respiratory insufficiency in patients with poliomyelitis.

Cultural Difference and Medical Care: The Case of the Spanish-Speaking People of the Southwest. By Lyle Saunders, Associate Professor of Preventive Medicine and Public Health (Sociology), University of Colorado, School of Medicine, Denver. Cloth. $4.50. Pp. 317. Russell Sage Foundation, 505 Park Ave., New York 22, 1954.

The author attempts to establish the necessity for closer liaison between the social scientist and the healing arts by a study of the cultural anthropology of the Spanish American culture of the southwestern United States and the relation of that culture to the promotion of health programs. The medical status of typical families of the Southwest is described. A detailed ethnological study of the Spanish American culture of the Southwest is presented. The author then considers the basic question: "How can more and better health services and medical care be provided to any population whose members differ culturally or subculturally from those who have a professional responsibility to provide them?" The fundamental point of view expressed is: "The practice of the healing arts is to a considerable extent a social activity in which the course of the relationship is determined not only by the knowledge, skills, feelings, and attitudes of the professional practitioner, whether physician, nurse, psychiatrist, or social worker, but also to a considerable extent by the knowledge, feelings, and attitudes of the patient, his relatives, and friends." Or said in another way: "In the practice of medicine or the development of public health programs social relationships and cultural patterns are of crucial importance." In somewhat more sociologic prose: "Cross-cultural medical and public health programs, to be even minimally effective and to have any assurance of continuance after the original impetus is withdrawn, must be integrated into the culture of the people they are intended to benefit." As may be expected, the author is a dedicated environmentalist who recognizes genetic factors but grants them little impact in human relations.

Of most interest to the physician is the author's principal point that: "One of the skills needed by the physician—and equally by the nurse, social worker, and others who work with people—then, is a skill in establishing and maintaining mutually satisfying social relationships. Such skills are based upon a knowledge of the psychological and social factors underlying the behavior of people, including oneself." To achieve this knowledge of social science the author strongly urges more preprofessional and professional training in sociology, comparative psychology, and cultural anthropology. His serious study and conclusions warrant careful consideration, especially by public health physicians and public health nurses. The slow, prolix prose, however, is not designed to promote a rapid review of the material.

These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

Textbook of Medicine. By Various Authors. Edited by Sir John Conybeare, K.B.E., M.C., D.M., Physician to Guy's Hospital, London, England, and W. N. Mann, M.D., F.R.C.P., Physician to Guy's Hospital. Eleventh edition. Cloth. $8. Pp. 904, with 40 illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2; E. & S. Livingstone Ltd., 16 and 17 Teviot Pl., Edinburgh 1, Scotland, 1954.

The popularity of this textbook of medicine is shown by the fact that the present edition is the 11th one that has appeared since the first one 25 years ago. The list of contributors includes distinguished teachers and lecturers. Since the 10th edition, several sections have been largely rewritten and revised. In general the pattern followed in the description of diseases includes etiology, morbid anatomy and pathology, symptoms and signs, prognosis, and treatment. The rapidly changing field of therapeutics makes it difficult to keep sections on treatment in a book of this kind up-to-date. This is particularly true in infectious disease. The illustrations and plates are appropriately selected and well placed. The sections on infectious disease, cardiovascular disease, renal disease, and diseases of the nervous system are outstanding. In addition to the regular text, the book contains three appendixes that deal with (1) examination for life assurance, (2) the sulfonamides and antibiotic drugs, and (3) cortisone and corticotropin. The appendix dealing with the sulfonamides and antibiotic drugs suffers from brevity and contains some statements that, in the light of current knowledge, are not entirely acceptable. Included in the discussion of antibiotic drugs are substances that are not truly antibiotics. In general, however, this book can be highly recommended. It should appeal to teachers, students of medicine, and practitioners.

Financing Hospital Care in the United States. Volume 2: Prepayment and the Community. Edited by Harry Becker. Cloth. $4.50; $9.85 per set of 3 volumes. Pp. 356, with illustrations. Blakiston Division, McGraw-Hill Book Company, Inc., 330 W. 42nd St., New York 36; 95 Farringdon St., London, E.C.4, England, 1955.

This second volume of the report of the Commission on Financing of Hospital Care represents partial fulfillment of the commission's effort "to study the costs of providing adequate hospital services and determine the best systems of payment for such services." It deals largely with an evaluation of voluntary prepayment, the amount of protection currently available, the amount purchased by the public, and the possible extension of prepayment coverage to groups now without protection. The report indicates that throughout its preparation the commission was directing it toward community groups interested in further development and extension of voluntary prepayment as an effective means for distribution of the costs and risks of hospitalization over the largest possible number of persons. It is aimed toward stimulating action at the community level in the evaluation of existing prepayment arrangements, with the hope that community efforts will subsequently realize the fullest possible potential of voluntary prepayment for the general public as well as for the hospitals.

The first chapter gives an interesting and informative résumé of the origin and development of voluntary prepayment, indicating that although prepaid hospital care programs in the United States were established as early as 1798 they did not begin to receive serious public or professional attention until about 25 years ago. Within 10 years of the time of increased public interest, voluntary prepayment had become an established social movement, and by 1954 most of the population had adopted it as a means of financing hospital care. Population coverage under voluntary prepayment is discussed in the second chapter. Early in 1954 Blue Cross alone covered 42,900,000 persons in the United States. Between this coverage and that afforded by insurance company groups and individual policies, well over 91 million Americans had such protection early in 1953. Chapter 3 describes the progress in extension of population coverage from about 12 million in 1941 to over 91 million in 1953, and chapter 4 indicates some of the important gaps in population coverage.

This latter chapter includes a valuable analysis explaining the gaps that exist in population coverage and advances requisites for filling these gaps. Chapter 4 deals with the extension of coverage to the nonwage and low-income groups and clearly indicates that full community return cannot be forthcoming if major population groups such as the aged, unemployed, low-income families, and public assistance groups are not included in the community-wide program for financing hospital care.

Subsequent chapters deal with such factors as the significance of benefit provisions, benefit provisions under voluntary prepayment, alternative benefit approaches, cost of filling gaps in prepayment coverage and benefits, factors affecting the price the public pays for prepaid protection, means of assuring effective and economical use of prepayment funds, and the community and hospital concern with prepayment. The report expresses the opinion that the future of voluntary prepayment as a method of adequately financing higher standards of hospital service, economically provided, will be largely determined by the degree to which all segments of the community join in making it an effective community institution meeting community needs. The commission makes a series of recommendations at the end of the volume, suggesting the ways and means whereby voluntary prepayment might accomplish maximum population coverage and broad benefit provisions and involve the lowest possible cost. The volume is full of well-documented information and deserves the careful study of individuals and community organizations.

Human Heredity. By James V. Neel, Ph.D., M.D., and William J. Schull, Ph.D. University of Chicago Committee on Publications in Biology and Medicine: Emmet B. Bay et al. College Library of Biological Sciences edited by Ralph Buchsbaum. Cloth. $6. Pp. 361, with illustrations. University of Chicago Press, 58th St. and Ellis Ave., Chicago 37; Cambridge University Press, Bentley House, 200 Euston Rd., London, N.W.1, England; University of Toronto Press, Toronto 5, Canada, 1954.

This is one of the few books on genetics devoted entirely to human genetics. It is written for advanced students of biology and medicine and for specialists in the field of genetics. Consequently the emphasis on mathematics may serve as a deterent to the average reader. Much of the material covered, however, can be read with pleasure and profit by the less qualified reader. The final three chapters dealing with the applications of genetic knowledge to man should be of particular interest to the practicing physician. In these the authors discuss the counseling of patients regarding genetic problems, blood-group determinations in cases of disputed parentage, and eugenic sterilization of the unfit. Also of general interest are the discussions on the genetic risks involved in the use of atomic weapons, genetic carriers of inherited disease, and genetically controlled biochemical defects.

Human Biochemistry. By Israel S. Kleiner, Ph.D., Professor of Biochemistry and Director of Department of Biochemistry, New York Medical College, Flower and Fifth Avenue Hospitals, New York. Fourth edition. Cloth. $7.50. Pp. 746, with 103 illustrations. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1954.

So rapidly is biochemical knowledge accumulating that new editions of this textbook for medical students appear at three-year intervals. Thus, in the new edition, "large areas have been completely rewritten, notably those dealing with blood coagulation, enzymes and coenzymes, physiological oxidations, cholesterol metabolism, urea formation, transmethylation, and the mechanism of insulin action. There has been extensive revision of the sections . . . [on] the tricarboxylic acid cycle, coenzyme A, formation of gastric HCl, biochemistry of tumors, the role of vitamin A in vision, acid-base balance, and the metabolism of a number of amino acids. Pentose and fatty acid metabolism have been given more space, and the use of isotopes is reflected in many chapters. Among the new topics thought worthy of discussion are the dextrans, triiodothyronine, glucagon, serotonin, the carbonic anhydrase inhibitors, blood iodine, lipoic acid, and the structure of insulin and of oxytocin. A section is devoted to the nomenclature of the steroids." The text is clear and is well illustrated. Clinical aspects of biochemistry are emphasized throughout. The index is extensive. The bibliographies are short, but the book is intended for beginners. The printing and binding are excellent.

Handbook of Laboratory Animals. Prepared by Institute of Animal Resources. Committee on Handbook: H. G. Herrlein, Chairman, G. B. Coursen, R. Randall, and C. A. Slanetz, National Academy of Sciences, National Research Council, publication 317. Paper. $1.25. Pp. 77. National Academy of Sciences, National Research Council, 2101 Constitution Ave., Washington 25, D. C., 1954.

This is a useful compendium that should find a place in all biological laboratories. The common diseases of laboratory animals are briefly mentioned, and suitable references are given for each of the diseases mentioned. Extensive tables showing the sources of supply for the different laboratory animals and also suppliers of animal feed are given. This information will save laboratory workers much time and correspondence in the search for sources of animals and special feeds. In the text is a selected list of the commonly used laboratory animals together with a bibliography of uses and experiments applicable to laboratory animals. There is a table containing the names and addresses of research organizations, the species of animals used by them, and also pertinent comments dealing with strains, weights, etc., of the different types used in these laboratories.

Chemical Pathways of Metabolism. Volume II. Edited by David M. Greenberg. Cloth. $9.50. Pp. 384, with 24 illustrations. Academic Press, Inc., 125 E. 23rd St., New York 10, 1954.

This second volume seems to be as carefully written, edited, indexed, and produced as the first. It contains three chapters by Dr. Greenberg on the carbon catabolism of amino acids, syntheses involving amino acids, and the metabolism of sulfur-containing compounds. One chapter apiece are contributed by P. P. Cohen who writes on the nitrogen metabolism of amino acids; by H. Borsook, on enzymatic syntheses of peptide bonds; by M. P. Schulman, on purines and pyrimidines; by L. A. Heppel, on nucleotides and nucleosides; and by S. Granick, on the metabolism of heme and chlorophyll. There is no preface to volume 2, so that if anyone came onto it separately he would remain ignorant of the purpose of the series.

Modern Occupational Medicine. Editors: A. J. Fleming, M.Sc., M.D., Assistant Medical Director, E. I. du Pont de Nemours & Company, Wilmington, Del., and C. A. D'Alonzo, M.D., F.A.C.P., Special Assistant, Medical Division, E. I. du Pont de Nemours & Company. Associate editor: J. A. Zapp, Ph.D., Director, Haskell Laboratory for Toxicology and Industrial Medicine, E. I. du Pont de Nemours & Company. Cloth. $10. Pp. 414, with 44 illustrations. Lea & Febiger, 600 S. Washington Sq., Philadelphia 6, 1954.

The contents of this book covers, under section 1, the evaluation of medical services in industry, the history of industrial medicine, administration, functions, location, personnel, layout and equipment, medical history and physical examinations, and medical records: their purpose, value, and study. Section 2 is devoted to industrial preventive medicine; section 3 to physical environment and occupational health, including temperature, humidity, air movement, noise, radiological hazards, and fatigue; and section 4 to services allied to occupational medicine. Psychiatry and toxicology are given separate sections. These subjects are treated in a practical way by those who know the needs and value of adequate medical controls and protection. Bibliographies accompany most of the chapters. The text is clear, well expressed, and should be of especial value to nurses, physicians, and management.

The authors are well-known specialists in their respective fields, and the high quality of in-plant medical services supplied to the employees of du Pont's many plants over the country gives an ample background for recording much valuable experience. They have dedicated this book to Dr. G. H. Gehrmann, a pioneer in the field of occupational medicine. Although he is a contributing author to this text, Dr. Gehrmann was unaware that the authors were dedicating this book to him. As he says in the introduction, "Industry has grown, expanded, and developed new products and new methods. A multitude of occupational diseases has accompanied this progress. . . . This volume has been presented with the hope that the information contained therein will be helpful toward a better understanding of the general principles and methods of industrial preventive medicine. The authors have tried to present, in a concise way, information that will be readily useful to physicians, executives, safety engineers and chemists in industry."

QUERIES AND MINOR NOTES

BRUCELLOSIS

To the Editor:—*A farmer, his wife and two children, and an occasional visitor have been using raw milk from his dairy herd of 18 cattle. The herd has been free of Bang's disease, but a few days ago a cow added to the herd last October was reported to have Bang's disease. Several cows have aborted during the past few months. All persons under question are clinically well except the wife of the farmer, who is said to be anemic and to fatigue easily. She is under study. All milk is now boiled. Please suggest a course of treatment if a diagnosis of undulant fever is established.* *M.D., Pennsylvania.*

Answer.—For the diagnosis of brucellosis in the foregoing family, it is suggested that specimens of blood be obtained from each person and submitted to a reliable laboratory for an agglutination test. If at all possible, specimens of blood should also be obtained for cultural purposes. It is known that asymptomatic persons may have a blood culture of Brucella. In addition, persons without symptoms may have Brucella agglutinins in the blood. Advice and information should be sought from the laboratories of the inquirer's state department of health. If a diagnosis of brucellosis is established in a person with symptoms, it would be best to treat him with a combination of dihydrostreptomycin and tetracycline. For adults, the recommended dose is 1 gm. of dihydrostreptomycin intramuscularly for one week twice daily, and the second week, 0.5 gm. of dihydrostreptomycin intramuscularly twice daily. Simultaneously, 0.5 gm. of a tetracycline drug is given four times a day orally for a total of three weeks. The dose will have to be reduced proportionately for infants and children. It would not be advisable to treat any of the persons who have no symptoms, even though agglutinins are present in the blood. However, asymptomatic persons in whom Brucella is found on blood culture should be treated.

FOUL BREATH

To the Editor:—*In 1945 I had infectious hepatitis. I did not remain strictly in bed, but walked around in the hospital after the first five days when I was acutely ill. I did well and had no trouble until 1949, when pain developed in my right side over the liver and gallbladder. The pain is in one small spot at the level of the last rib and slightly lateral to the midclavicular line; has never been severe and has never varied from this spot; will last for a month or two, and then cease for a month or more; and increases on ingesting fatty foods. My breath is extremely foul, and of an acetone nature, during these times. This condition has become worse, and it is very embarrassing and offensive. Would it be possible for the hepatitis to have damaged the liver cells or affected metabolism of acetone bodies? Complete physical examination was normal with the exception of a sulfobromophthalein (Bromsulphalein) sodium retention of 8% in 45 minutes. Any advice that you give will be appreciated.* *M.D., Kentucky.*

Answer.—It would be very unusual for a localized painful area to develop as a complication of acute viral hepatitis. The fact that this did not develop until four years after the acute illness of hepatitis makes the hepatitis even more unlikely as an etiological agent. The foul breath of which the patient complains does not suggest fetor hepaticus. The odor of fetor hepaticus is usually a sweet odor and not foul, but it could possibly be confused with acetone. Fetor hepaticus may appear with many liver diseases, and in severe instances of hepatic injury it has been reported to persist for many years. It is suggested that the patient have roentgen examination of the gallbladder and stomach and have thymol turbidity and cephalin cholesterol flocculation tests made.

TICKS AND CHIGGERS

To the Editor:—*In North Carolina each summer there is a plague of ticks, the commonest being Amblyomma americana, and chiggers (Trombicula alfreddugesi), which collect by hundreds on anyone walking in the woods and fields. The bites by these insects in some persons swell up into thumbnail-sized pruritic papules, frequently with vesicular peaks. In other persons the bites cause only a small red mark that causes little distress. Persons who have lived here all their lives are not particularly bothered by these bites, while those coming from the North for short visits are likely to be affected severely. How can chigger infestations be prevented?*

M.D., North Carolina.

Answer.—Chigger infestations may be prevented by the disinfestation of terrain or by the use of repellents. It has been shown that the insecticide dieldrin, when sprayed on the ground at the rate of 2¼ lb. to the acre, is highly effective against chiggers, and this same compound is also apparently useful against ticks (Traub, R., and others: *J. Econ. Entomology* **47**:429, 1954; Therrien, A. A., and others: ibid. **47**:76, 1954). Repellents such as dimethylphthalate or dibutylphthalate applied to the legs are effective in preventing attachment of chiggers. These compounds are often available in stores selling Army surplus goods. The best method of preventing infestation is to impregnate socks and trousers with the proper dilutions of such compounds as a mixture of benzyl benzoate and dimethylphthalate or benzyl benzoate and dibutylphthalate. Clothing treated with such compounds is repellent to chiggers even after six or more washings. Most repellents are not very effective against ticks, but the Army clothing-impregnant M-1960 is very satisfactory in this regard. M-1960 contains equal parts of N-butylacetanilide, 2-butyl-2-ethyl-1, 3-propanediol, and benzyl benzoate, with 10% of an emulsifying agent.

CANCER OF THE MALE BREAST

To the Editor:—*A 56-year-old man with bleeding from the nipple of the right breast, without palpable tumor present, smear negative for cancer cells but biopsy showing early papillary carcinoma originating in duct papilloma, had a wide simple mastectomy with exploration for axillary nodes (none found). The patient's chest and supraclavicular and infraclavicular regions were normal. Six months have passed, and the patient is asymptomatic, with physical examination essentially normal. What is the surgical management—wide simple mastectomy or radical mastectomy—in male breast cancer? What should be looked for in the way of recurrence or metastases? Should any further treatment be advised? Is there any relation between bleeding from the nipple or cancer of the breast in the male and early alcoholic cirrhosis of liver, especially if the cephalin flocculation value is 3+?*

Irving I. Crouse, M.D., Buffalo.

Answer.—The proper surgical management of carcinoma of the male breast is the same as for mammary cancer in the female; radical mastectomy should be the procedure of choice when the setting is operable. Since less skin is available for closure, local recurrence may be commoner following a radical operation in the male, unless skin grafting is made a part of the initial operation. Metastases following radical mastectomy occur in the same areas in the male as in the female, bone and lung being the commonest initial sites. If the chest film and skeletal survey show no evidence of metastases six months after simple mastectomy, one must strongly entertain the idea of

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The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

advising a radical axillary dissection with removal of the pectoral muscles. If this is not feasible, roentgen therapy to the operative area and lymph drainage areas is definitely indicated. Gynecomastia develops in a number of male patients with cirrhosis of the liver, probably as the result of reduced hepatic function and the inability promptly to excrete estrogens from the blood. It is extremely rare to see bleeding from the nipple associated with gynecomastia. This lesion is not considered precancerous.

ADIE'S SYNDROME AND STERILITY

To the Editor:—*A 37-year-old white man who had lived in sterile marriage for four years was seen by me for evaluation of his spermatogenesis. Repeated examinations of fresh ejaculate showed complete azoospermia. He is afflicted with typical Adie's syndrome. It has been stated* (J. A. M. A. **147**:97 [Sept. 1] 1951) *that this malady is a heredodegenerative disturbance affecting the vegetative centers of the diencephalon and their connections with the mesencephalon. Since this patient denies ever having had mumps, gonorrhea, or syphilis, and since the genitals seem normal in every other respect, I wonder whether Adie's syndrome and the azoospermia in this case might be caused by the same heredodegenerative disturbance.* *Kurt Oppenheimer, M.D., Norwich, Conn.*

Answer.—Adie's syndrome with azoospermia has not been reported previously, but it is probable that the association is not fortuitous and that both result from the same heredodegenerative disturbance. Adie considered that the myotonia involved the pupil incidentally and that a disease of the vegetative nervous system was probably present. In confirmation, Kennedy and others (*Arch. Ophth.* **19**:68 [Jan.] 1938) cited cases with emotional disturbance in which improvement of the pupillary abnormality followed freedom from nervous tension. Hypothalamic connections with the frontal lobes, thalamus, pituitary gland, and spinal cord have been demonstrated experimentally. Whereas the instillation of methacholine chloride in 2.5% aqueous solution does not affect the normal pupil, Sheie found that this solution invariably contracted the tonic pupil, which would indicate that the tonic state of the pupil results from a partial parasympathetic denervation at the ciliary ganglion. This diagnostic test may also be valuable for therapy to overcome the relaxation of the ciliary muscle and the consequent difficulty with near vision after the eyes have been used for distant vision.

INCREASED PULSE RATE IN HEART DISEASE

To the Editor:—*A woman, aged about 60, has mitral stenosis and auricular fibrillation. Her heart failed a few months ago but responded to the usual treatment. She feels well at present, but her pulse rate is consistently over 100 beats per minute in the office in spite of a definite digitalis effect. Her basal metabolic rate is normal. What would keep her pulse rate elevated in spite of complete digitalization?*

B. A. Lucking, M.D., Helena, Mont.

Answer.—An exact answer can be given only after a detailed history, physical examination, and comparison of repeated electrocardiograms. A persistent increase of pulse rate can be due to: 1. Excessive digitalization. While this frequently causes premature contractions, ventricular tachycardia, or sinus bradycardia, it may cause a rapid ventricular rate in patients with atrial fibrillation. 2. Insufficient digitalization. In spite of moderate evidence of "digitalis effect" in the electrocardiogram, the patient may not receive enough digitalis. In general, insufficient digitalization is associated with evidence of failure, but this is not necessarily felt by the patient. Physical data of congestion, increased circulation time, or at least exertional and postural dyspnea, may confirm this possibility. 3. Irreversible myocardial damage caused by myocardial fibrosis. This may be the result of rheumatic carditis, coronary heart disease, or even large doses of digitalis for many years. Evidence of congestion or functional data would be evident, as in insufficient digitalization. 4. Active rheumatic carditis. This may not be accompanied by fever and is sometimes difficult to prove or disprove. There should be an increase of sedimentation rate, and there should be evidence of congestion or, at least, functional deterioration, as in insufficient digitalization.

PIGMENTED NEVUS

To the Editor:—*Has a melanoma ever been caused by surgical removal of a pigmented nevus? What are the chances of a pigmented nevus of the sole of the foot becoming malignant?*

Jacob Greenblatt, M.D., Stamford, Conn.

Answer.—There is no evidence to support the idea that adequate surgical removal of a pigmented nevus will cause a melanoma to develop. When such reports are made they are of the result of excising a melanoma and not a nevus. However, efforts to remove a junction nevus by fulguration, partial electrical or chemical cauterization, or any inadequate destructive measure may eventuate in a melanoma. Accordingly, every nevus that is removed should, by preference, be completely and widely excised or completely destroyed well beyond and below the borders of the nevus.

The chances of a pigmented nevus of the sole of the foot becoming malignant are great. In fact, the likelihood is so great that it is recommended that all nevi of the feet should be removed completely by surgical excision, followed by histopathological examination to determine the nature of the lesion. All nevi that are subject to repeated irritation from belts, garters, girdles, etc., or are at points of pressure from sitting, occupational trauma, or other causes should also be completely removed.

IRON CACODYLATE

To the Editor:—*In a neighboring community 5 cc. of iron cacodylate is being given for arthritis, low back pain, Dupuytren's contracture, various skin rashes, and other chronic disorders. Please give a frank discussion of the therapeutic value of this material.* *M.D., Arizona.*

Answer.—Although iron cacodylate, which is still official in the National Formulary, has long been used rather empirically in a variety of diseases in which iron and arsenic were believed to be useful, no satisfactory clinical evidence establishing its value in the various disorders mentioned in this query is known. More than 30 years ago the Council on Pharmacy and Chemistry, in announcing the omission of ferric cacodylate from New and Nonofficial Remedies, described the drug as an irrational and useless method of administering iron and arsenic. The 1951 edition of the Epitome of the U.S.P. and N.F., a publication prepared under the supervision of the Council on Pharmacy and Chemistry, repeats this opinion.

PREGNANCY AND ARRESTED TUBERCULOSIS

To the Editor:—*A woman with apparently arrested tuberculosis is interested in becoming pregnant. She has had therapy for 15 months with streptomycin and* p-*aminosalicylic acid, and gastric cultures have been negative for a year. She is 28 years of age. I feel that it might be an additional safeguard to continue to administer 1 gm. of dihydrostreptomycin and 1 gm. of streptomycin weekly plus 12 gm. of* p-*aminosalicylic acid daily through the pregnancy. Will these dosages endanger the fetus?* *John C. Tate, M.D., Springfield, Mass.*

Answer.—There is no evidence to date to indicate that the course of therapy suggested above would prove detrimental to the fetus.

DREAMS

To the Editor:—*I would welcome information with regard to the "color" of dreams. Is there any relation between the color of dreams and the color vision of the person?*

M.D., New York.

Answer.—Dreams usually occur with no distinct color, in what is often referred to as a "black and white image." However, a small number of persons, probably about 5%, have dreams in color or with colored highlights regularly or occasionally. The significance of color in dreams is not established. No correlation to color blindness has been reported; it is not likely that a color blind person would be able to visualize actual colors that he cannot otherwise perceive. A recent article (Linn, L.: Color in Dreams, *J. Am. Psychoanalytic A.* **11**:462 [July] 1954) suggests that color in dreams is a reflection of some previous real color experience.

ANESTHETIC DEATH

To the Editor:—*The answer to the query on anesthetic death in* The Journal *for Jan. 15, 1955, page 301, was interesting but still left unanswered the basic definition of an "anesthetic death." In the deliberations of the anesthesia study commission of the Philadelphia County Medical Society, the term anesthetic death has been abandoned. In the final determination of a case under examination, the question is asked, "Is this a preventable death from the standpoint of anesthesia?" We find that the use of this terminology is more applicable to situations in which the death may not have been primarily caused by the anesthetic drug or technique but in which there was a substantial contribution to the death. So many factors may enter into a determination of whether the anesthetic literally caused the patient's death, factors which sometimes operate against the specific drugs used for the aptitude of the anesthetist, that to label a particular case as an anesthetic death might result in an unjust criticism of the anesthetist, drugs, or techniques which were used.*

In adopting the phrase "preventable from the standpoint of anesthesia," we have found that our discussions are much freer and that the knowledge forthcoming from any particular case is apt to be more complete. Consequently, were I to answer the original query I would say that an anesthetic death would be a death which was preventable from the standpoint of anesthesia. This encompasses the responsibility of the anesthesiologist prior to, during, and after anesthesia; the part the choice of anesthetic played; the technique used in administration; and whatever efforts were made at resuscitation, and still leaves room for honest error in judgment without indicting a particular anesthetist, drug, or technique.

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HIGH EOSINOPHIL COUNT

To the Editor:—*In* The Journal, *Jan. 8, 1955, page 201, is a letter from Dr. C. L. Concklin of Corpus Christi, who invites suggestions concerning diagnosis and therapy in a 2½-year-old child with chronically high eosinophilia. I believe that the consultants to whom this inquiry was referred may have overlooked one important possibility. Visceral larva migrans, which has been proved to be caused by the larvae of the dog nematode, Toxocara canis, migrating to and within the viscera of the human body can cause a syndrome identical to the one described. The age is correct (18 to 36 months), and the high, constant eosinophilia, the Löffler's syndrome, and the absence of ova in the stools seem to indicate that Dr. Concklin should check all household pets for possible T. canis or T. mystax infestations. The disease appears to be relatively benign and is self-limiting provided reinfestation does not take place. The old worm therapies do not seem to be indicated, and therapy with Hetrazan has been inconclusive.*

There are two basic references dealing with this recently recognized disease. The first (Beaver, P. C., and others: Pediatrics **9**:*7 [Jan.] 1952) describes the disease, gives several case histories, positively identifies T. canis larvae in human liver lesions, and gives the disease its name. The second reference (Smith, M. H. D., and Beaver, P. C.:* Pediatrics **12**:*491 [Nov.] 1953) describes the production of the syndrome in two mentally defective children after experimental ingestion of T. canis eggs.*

Reid Gullatt
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QUINIDINE FOR MUSCULAR CRAMPS

To the Editor:—*I was surprised at the answer your consultant gave to the query entitled "Quinidine for Muscular Cramps" on page 1635 of* The Journal *for Dec. 25, 1954, to account for the leg cramps experienced by a patient after satisfactory relief of sciatic pain by disk operation. Actually, it commonly occurs that a patient relieved of symptoms by intervertebral disk surgery will have troublesome cramps in the leg, particularly during the night, over a period of many months. The cramps are usually relieved by the patient's getting up and stretching them out. These cramps occur in young persons who have no deficiency in arterial circulation, and obviously, since they occur at complete rest, the cramps would not be a symptom of occlusive arterial disease except in the advanced stages. Improvement or relief after the administration of quinine or quinine-like drugs seems to be well established, and I have used quinine for several years. Strangely enough, the occurrence of such cramps is rare during any phase of active nerve compression by a ruptured disk. On theoretical grounds alone, I would guess that the cramps result from some stage of repair as the nerve recovers from long-standing compression. The occurrence of such cramps is unrelated to recurrence of rupture of the disk or to occurrence of a disk rupture at a new level. These cramps are represented by actual knotting of muscle, as in a "charley horse." In other words, neuromuscular irritability appears to be increased in a way not too unlike that in myotonia congenita (Thomsen's disease), which is also greatly benefited by quinine.*

F. Keith Bradford, M.D.
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Houston 25, Texas.

To the Editor:—*I was surprised to read in* The Journal *for Dec. 25, 1954, page 1635, the answer of your correspondent concerning cramps in a patient who had previously had sciatica, stating that he rejects the idea of those cramps being possibly related to the sciatica. Cramps are a frequent sequel of sciatica, even when typical pains of sciatica, Lasègue's sign, etc., have disappeared. Cramps may be observed if recovery has been either spontaneous or due to surgical treatment. They occur oftener after a severe sciatica and especially after a sciatica involving the first sacral nerve with disappearance of the Achilles tendon reflex. In the case inquired about, the occurrence of the cramps six months after operation is no exception. I recently published a book (Comment traiter la sciatique, Paris, France, Ernest Flammarion, 1954) dealing with 3,000 cases of sciatica.*

J. A. Lievre, M.D.
77, Rue de Lille (7E), Paris, France.

CANKER SORES

To the Editor:—*I have read the query, "Proposed Theory for Investigation of Canker Sores," in* The Journal *of Jan. 15, 1955, page 301. Within the last two years, I have seen three patients who suffered from recurrent ulcerative stomatitis in rather extreme degree. One of these patients would have canker sores appearing in crops with severe surrounding inflammatory reaction, the whole bout lasting as long as three weeks. This patient's history extended back at least 10 years. The other two cases were similar but milder. All of these patients have been relieved by multiple vaccination with smallpox vaccine at roughly weekly intervals on about 10 occasions. They now report for "booster" vaccination whenever they have a canker sore. While other mechanisms are undoubtedly operative, this experience suggests the possibility of viral origin in some of these cases.*

George B. Hood, M.D.
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MARITAL RELATIONSHIPS

To the Editor:—*Concerning the marital relationships described in* The Journal, *Oct. 23, 1954, page 803, the first answer given is incorrect in saying that, according to canon law, "where sex of the persons involved is appropriate, there is no proscription [of marriage] on persons related as . . . 1 and 5" (i. e., as stepgrandparent and stepgrandchild). In canon law this relationship is direct-line affinity in the second degree (canon 97); but direct-line affinity in any degree invalidates marriage between the persons so related (canon 1077). Accordingly, if a man, after the death of his wife, marries his stepgranddaughter, the marriage is null and void according to canon law. Hence, also, the second answer is incorrect in saying that "such a relationship has no real meaning."*

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